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Editorial Notes

Smoke Abatement

LAST year's Report of the Department of Scientific and Industrial Research on the Investigation of Atmospheric Pollution stated that there were definite grounds for belief that the smoke abatement movement had had a real effect, that on the whole there had been a definite reduction in the extent of pollution of the atmosphere in Britain during the past twenty years. In this change for the better the Gas Industry has played a major part in supplying two smokeless fuels in gas and coke; but what an uphill fight it has been to arouse public interest in the problem, and how little aware is the public even now that in the combined use of gas and coke lies a remedy for a colossal wastage of national resources and national wealth. We have had a good deal to say on the subject of late in these columns but we return to it without any excuse, for we are sure that the future of the Gas Industry is linked up with the smoke abatement movement, and that if only the public could be led to appreciate that a remedy is at hand, at a cost which would not cause inconvenience to the individual, very rapid strides indeed would be made.

In smoke abatement our Industry has an opportunity which no other industry possesses, and it may well be questioned whether the chance is to some extent being ignored. In his Presidential Address to the National Gas Council last May Sir David Milne-Watson referred to the problem, and he discussed it in greater detail in the Paper he gave last month at the International Engineering Congress in Glasgow. "The use of raw coal in domestic grates," he said, "is responsible for three-quarters of our national smoke problem, which in money alone is reckoned to cost over £1 per head of the population per annum, and in damage to health and the amenities of life is still more objectionable. Secondly, it is thoroughly inconvenient and in most cases inefficient. The labour and dirt caused by using raw coal in old-fashioned domestic appliances need no description. In the working-class home, where the coal range even to-day is asked to warm a room, cook food, and heat water simultaneously, the result is to turn the living room into a kitchen, to get no hot water in summer save by roasting the family, and to fill the skies with wasted fuel. . . . In contrast to a smoky, laborious, dirty, and inconvenient fuel system, a system smokeless, labour-saving, clean, and convenient is the obvious need. The Gas Industry is able to provide such a system." To-day over half our domestic heat requirements are met by the burning of bituminous coal. Yet on the score of cost the use of raw coal cannot be defended. The combined use of gas and coke can provide a fuel system really worthy of the twentieth century and within the family budget.

N.S.A.S.

THE aim, then, should be to translate the public's growing interest in smoke abatement into action, and no effort should be spared towards this end, which is highly desirable from the point of view of the community as well as that of the Gas Industry. Now the National Smoke Abatement Society, as was pointed out in the last annual report of the National Gas Council, has provided a focus for the activities of all organizations and individuals interested in the question, and in his Address Sir David expressed the hope that every gas undertaking would support the Society. We ourselves on several occasions have expressed the same hope. For many years now the Society, with most limited resources but with ample courage and perseverance, has sought, and recently with more success, to bring about not only the public's recognition of the smoke evil, but the public's knowledge that it need not exist. We wonder whether the Gas Industry appreciates as it should the good work which the Society has done. It was formed in 1929 by the amalgamation of the Coal Smoke Abatement Society, established thirty years previously, and the Smoke Abatement League, founded in 1909, and it is an organization dependent entirely on voluntary support. Its objects are to create an informed public opinion on the evils of air pollution, to enquire into and assist investigations directed towards the abolition of smoke, to popularize the use of smokeless methods of heat production, and to promote and support legislation for preventing the pollution of the atmosphere. Surely the Gas Industry shares these aims. When the Society was formed in 1929 its income was under £500 a year. This has grown year by year, but even now is surprisingly small—in the neighbourhood of £1,250. Twelve months ago the Society moved its headquarters from Manchester—a city which has done pioneer and effective work in the cause of smoke abatement—to the Metropolis, where it will, of course, be more closely in touch with other organizations interested in the movement, and we look to a widen-

ing of the range of its activities. The Society has, it must be admitted, had Gas Industry support, but, though through central channels and individual contributions this financial support accounts for something like a quarter of its income, the total is, as we have said, surprisingly small, and it is obvious that the incidence of overheads on such an income is heavy. The point is that with, say, double the income, the effective work of the Society might be quadrupled; and an income of £2,500 a year for an organization concerned with a major national problem and with an experience of nearly forty years is in all conscience paltry enough.

Arousing Interest

LET us examine for a moment what the Society has helped to accomplish, in spite of its meagre income. It must in some measure have been instrumental in calling the attention of the Government, through the Ministry of Health, to the smoke nuisance. The Alkali Inspectors are very much concerned with the problem of industrial smoke prevention, and the Chief Inspector for England and Wales in his report last year expressed the opinion that the time will come when the burning of raw coal will not only be regarded as an offence against public amenities but will be prohibited on economic grounds. While noting with satisfaction some amelioration of the domestic smoke nuisance due to the growing use of smokeless fuels, his observations in regard to industrial smoke have shown that little progress has been made except in those districts where cheap gas is available. Cheap gas has, of course, effected much, and doubtless extension of the application of coke oven gas where circumstances permit will help matters in the future. There exists a great field for development in this direction. Quite apart from initial fuel cost, however, manufacturers as a whole do not yet fully appreciate the advantages of gas from the points of view of ease of control, cleanliness, saving in labour and space, and elimination of wastage in processes of manufacture. We have still much spade work to do in the way of propaganda and demonstration to make industrialists think in terms of over-all costs of the product rather than to compare fuel bills alone.

There are now 155 local authorities affiliated to the Society, representing nearly half the population of the country; and apart from money contributions there is the moral support which such an association gives. Not all authorities, unfortunately, are imbued with the same desire to see smoke abolished and to put into force practical plans to this end. As we have said, there exist effective means of combating the domestic smoke nuisance and at a total fuel bill no greater—in general, in fact, less—than that incurred when the fuel for the open firegrate is raw coal. Local authorities should be made more aware of these means and they in their turn should impress upon the ratepayers the desirability of individual effort in promoting smoke abatement. They might to advantage, for instance, follow the lead of the Uxbridge Urban District Council, who not long ago decided to enclose a leaflet on the subject with its rate notes. We have, of course, been able to record in our columns notable examples of good work carried out by some local authorities. Leeds at once springs to mind. There, since 1935, the proviso has been that all ranges installed in Corporation houses must be suitable for burning smokeless fuel. We have in mind, too, the smokeless estate of the Oldham Corporation at Chadderton and of the Manchester Corporation at Withenshaw. In the development of both these estates the gas undertakings collaborated fully. At Chadderton, for example, the success of the scheme has been largely dependent on the co-operation of the Oldham Gas Department, which, because of the small fuel storage space attached to the houses, guaranteed deliveries of coke twice a week. The Withenshaw scheme comprises 25,000 houses and in the industrial zones the burning of raw coal is prohibited; Manchester's satellite town is an effective advertisement for gas and coke.

Regional Committees

THEN we have the work of the Smoke Abatement Society in promoting the formation of Regional Smoke Abatement Committees. Such Committees have now been set up covering Northumberland and Durham, the West Riding of Yorkshire, Manchester and District, West Lancashire and Cheshire, the Midlands, and just lately Greater London. It is obviously more practicable for the Ministry of Health to deal with a committee representing a consolidated region than with a number of individual authorities, and a joint advisory committee can operate to good advantage in correlating the work of its constituents, in ensuring uniform administration, and in making propaganda fully effective. Again, we have the Society's interesting proposal that local authorities should combine to get powers to proclaim a smokeless zone covering the central areas. In this area the emission of smoke from any house, business premises, or factory should be forbidden. As a practical move towards the abolition of smoke the establishment of smokeless zones appeals to us very much indeed. The possibility of being able to walk through an area without seeing a single smoking chimney would be of the greatest value. Smokeless zones—well defined areas specified and controlled by by-laws—would serve as examples to others outside these areas and would provide real incentive to further efforts to ensure a clean and healthy atmosphere.

The National Smoke Abatement Society has enlisted the active support of medical officers of health; it has, in fact, paved the way to render further effort in the cause of smoke abatement ever so much more effective. In this effort the Gas Industry can play a most—indeed, the most—important practical part, and it would be well at this stage to consider how best it can link up with the work of the Smoke Abatement Society, by way of publicity, health exhibitions, and display work. The Industry might do worse than plan for a concerted smoke abatement week—say at the time of the holding of the Society's annual conference—concentrating its sales propaganda and its showroom windows throughout the country on smoke abatement. Everybody engaged in the Industry could with enthusiasm find ways and means of forwarding the movement, and each individual undertaking would do well, as Sir David Milne-Watson urged, to support generously the Society's funds.

P.E.P. on Coal

ONE of two broadsheets surveying the position of the coal industry has been issued by P.E.P. (Political and Economic Planning). It gives in outline the story of what has happened in coal politics since 1935; the next will turn to the economic aspect of the industry. The aim has been to give "a balanced and impartial account." We are concerned here with one section only of this broadsheet, that relating to the cause and effect of the coal selling schemes, which have operated with such detriment to the Gas Industry. Partly

through its own inefficiency and partly through the superior bargaining power of large consumers, it is argued, the coal industry was for some years prior to 1936 forced to sell to utility undertakings and large industrial consumers at prices which made only a meagre contribution to total costs of production, and to attempt to make up for the losses or lack of adequate profits in that market by taking it out of the weakest customer—the household consumer. "This policy was wholly contrary to the long-term requirements of the industry. In view of the competition from gas, electricity, and oil, the household consumer is to-day quite the most vulnerable section of the coal industry's market, while utility companies and many classes of industrial consumer who are vitally dependent upon coal supplies are relatively inelastic consumers. If it comes to the question of raising prices, the inelastic consumer is likely to accept an increase without a material reduction in his consumption, while the effect of an increase on an elastic market may be a sharp curtailment of consumption. Prior to organized selling, the coal industry was pursuing the wholly uneconomic policy of pampering the inelastic consumer and browbeating the elastic consumer."

For a "balanced and impartial account" the terms "pampering" and "browbeating" have a strange ring, and we say without hesitation that prior to 1936 the Gas Industry was in no way pampered, and it is quite wrong to regard it as inelastic in the sense indicated in the P.E.P. broadsheet. Prior to 1936 gas undertakings bought their coal by the ordinary process of commercial negotiation, and following the Coal Mines Act of 1930 it is a fact that gas undertakings had to pay considerably more for their coal than the collieries' own coke ovens and more than other industries, such as the chemical industry, iron and steel, paper, cement, cotton, and engineering. In 1935, whereas other industries were asked to accept a voluntary increase of 1s. a ton in the price of coal, the Gas Industry was asked to accept 2s. a ton. It has been stated many times, and as many times denied, that the Industry had not been paying a fair price, that its coal had been bought under the cost of production. In fact, the prices paid were absolutely fair, and if the coal industry had been able to obtain such prices all round it would have obtained a reasonable profit and been able to pay better wages to the miners.

In any case, whatever the conditions prior to the working of the selling schemes, the Industry has had good cause for concern since their operation. Not only are gas undertakings paying more than 5s. a ton more for coal compared with 1935, but they have been unable to purchase the quality of coal they needed for efficient operation. Increasing costs have been accompanied by deterioration in coal quality and often the inability to obtain the types of coal which have been shown to give the best gas-making results. Not only this, the question of delivery has arisen, and now gas undertakings have to stock and withdraw coal, adding to handling costs and, with certain coals, considerable deterioration in quality as a result of storage.

Then we turn to the "inelasticity" of the Gas Industry. In the home and in industry gas is in competition with raw coal and also oil. Industrialists are realizing more and more the advantages of a controllable fuel, and if, through the high cost of coal charged to the Gas Industry, it became impossible to offer them gas at economic rates, then it is more than likely that they would turn to the use of oil, and the coal industry would be the losers. Competition does in fact render the Gas Industry "elastic" in its coal requirements. There is one other point we would stress. It must be acknowledged that there is a growing public demand for smokeless and convenient fuel, a demand met by gas and coke; and the public will not be happy about a policy aimed at making them more, and not less, dependent on raw coal, with all the filth and labour which its use involves.

Junior Association Programmes

The proposal now under consideration by the Council of the London and Southern District Junior Gas Association—referred to briefly in last week's "JOURNAL"—raises an important issue which has long been a stumbling block among the Junior Associations. More to-day than ever before are the various phases of the Industry's activities in which the average Junior is concerned becoming specialized jobs. The result is that the varied interests of different members inevitably render the general meetings at which Papers on specific aspects of the Industry's work are discussed of interest or benefit to a limited number of members only. True, the Councils of Junior Associations generally manage so skilfully to arrange the session's programme so as to include subjects which will appeal in turn to every "school of thought;" but in order to achieve this they are reducing the practical value of such meetings to the individual member by, perhaps, two-thirds. Very few Papers are read which are of direct interest to all; indeed, one cannot expect it. What the London and Southern Juniors have in mind is a sub-division of the Association into three subject groups—namely, Manufacture, Distribution, and Utilization. The objects of this sectionalization are, of course, to enable the members, and particularly the younger members, to discuss details of their work and exchange experiences in a more informal manner than is often possible at a full general meeting, while another object is to hold the "group" meetings in a way that will allow ample time for free and frank discussion and give a large number of members the opportunity of putting their ideas and experiences before a technical gathering largely or wholly interested in the same subject. There is much to commend such a scheme. The matters discussed will not be reported in the Press or the Joint Transactions—though outstanding contributions may be submitted, we understand, to the Council for publication. It is to be hoped that this proposal may be brought to satisfactory fruition and that other Associations which are faced with the same problem of catering for varied interests will consider following the lead. It cannot but redound to the advantage of all concerned.

Forthcoming Engagements

July

21.—I.G.E.—Meeting of Gas-Works Safety Rules Committee, 2.30 p.m.

22.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.15 a.m.; Joint Research Committee, 2.30 p.m. (*Transferred from June* 24.)

August.

9, 10, and 11.—Irish Association of Gas Managers.—Annual Meeting in Dublin.

September.

8.—North British Association.—Annual Meeting at Largs.

23.—I.G.E.—Joint Lighting Committee, 2.30 p.m.

October.

1-4.—B.C.G.A.—Annual General Meeting and Conference at Brighton (for Programme see p. 34 of "JOURNAL" for July 6).

National Gas Council

Meeting of the Central Executive Board

A meeting of the Central Executive Board of the National Gas Council was held at Gas Industry House, No. 1, Grosvenor Place, S.W. 1, on Tuesday, July 12.

Election of Chairman of the Board.—Sir David Milne-Watson, Bart., LL.D., D.L., was unanimously re-elected Chairman of the Board for the ensuing year.

Election of Vice-Chairmen of the Board.—The following Vice-Chairmen were unanimously re-elected:

Alderman J. H. Lloyd, M.A., J.P.
Mr. Frank Jones, M.Inst.C.E.
Mr. William Cash, F.C.A., J.P.
Councillor G. H. Kitson.

Obituary.—The Chairman referred with very deep regret to the death of three members of the Board—namely, Mr. W. E. Price, Mr. George Anderson, and Mr. E. H. Hudson. Mr. Price had been Hon. Secretary of the Council since its formation in 1916 until January, 1937, when he had to resign owing to ill-health. Mr. George Anderson was another representative who had been a strong supporter of the Council's work since its inception. Mr. E. H. Hudson had been a member of the Board since 1924, and his knowledge and experience had been of very great assistance.

Alderman Sir William Kay.—It was unanimously agreed that a letter of congratulation should be sent from the Board to Alderman Sir William Kay upon his election for the third time as Lord Mayor of Manchester.

Election of Representatives of The Institution of Gas Engineers.—It was reported that the following representatives had been appointed to serve on the Board for the ensuing year, in accordance with the Rules:

Mr. Robert Robertson.
Mr. George Dixon, B.Eng., M.Inst.C.E.
Sir Frederick West, C.B.E., J.P.
Mr. John Terrace, M.Inst.C.E.

The Chairman took the opportunity of welcoming the President of The Institution of Gas Engineers, Mr. Robertson, and Sir Frederick West, as members of the Board.

Re-appointment of Committee of the Council for the Forthcoming Year.—It was reported that a Memorandum had been circulated with the names of the members of the Committees of the Council. It was agreed that the following Committees should be discharged, and the remaining Committees re-appointed:

Consultative Committee with Coke Oven Owners.
Joint Parliamentary Committee on Gas Charges.

Coal.

(*a*) *Coal Bill.*—It was stated that a Report had been issued to the members of the Board, dealing *inter alia* with the amendment accepted by the Government on the Report Stage of the Bill, whereby non-statutory undertakers could in cases where the support of their land was threatened owing to the working of the Coal Commission, apply to the Court of Railway and Canal Commission for a right of support, and that such right might be granted without awarding compensation to the Commission.

(*b*) *Coal Prices (Departmental) Committee.*—A document setting out the personnel of this Committee was handed round, and a letter had already been circulated from the Mines Department asking advice as to which important Gas Undertakings in the Provinces they might usefully approach to give evidence with regard to coke.

It was arranged that Officers of certain Undertakings should be asked if they would be prepared to give evidence before the Committee.

Public Health (Drainage of Trade Premises) Model Draft By-laws.—Referring to the Act that had been passed last year giving industrialists the right to discharge effluent into sewers subject to by-laws to be made by the Local Authorities, it was reported that Model By-laws for this purpose had now been issued by the Ministry of Health. These by-laws, however, would probably have to be adapted to meet the particular circumstances of each Local Authority. It was important that every industrialist should have notice of any action proposed to be taken by the Local Authority, and a circular letter had therefore been sent by the Council to all its members, advising them to have their names placed upon the local register, as this would ensure that they received all notices issued by the Local Authority concerned.

Hire Purchase Bill.—It was stated that a Report had been issued to the members of the Board, setting out the position. A special provision relating to existing agreements had been incorporated in the Bill, whereby in the case of a breach of the agreement the owner would be entitled to serve upon the hirer 28 days' notice, specifying the amount of the installation charges. Where this was done, it would not be necessary for the owner to apply to the Court for recovery of possession, unless the hirer had paid the whole of the installation charges specified in the notice, and one-third of the hire purchase price.

Rating and Valuation.—A Report had been circulated from which it was seen that the Conjoint Conference of Public Utility Associations had already had one meeting with the Chartered Surveyors' Institution and the Rating Surveyors' Association in an endeavour to reconcile their views. Good progress had been made, and it was hoped that further meetings would achieve complete unanimity.

Income Tax—Memorandum to Inland Revenue.—It was reported that the special committee appointed by the Board in December, 1937, had now agreed upon a Memorandum which had been submitted to the Inland Revenue. The various points contained in the Memorandum would no doubt be subject to further discussion with the Inland Revenue.

British Industries Fair, Castle Bromwich, 1939.—The following representatives were appointed to serve on—

(*a*) *Gas Industries Section Committee.*

Mr. W. J. Sandeman.
Mr. Stephen Lacey.
Mr. C. M. D. Belton.

(*b*) *Joint Gas Conference Committee.*

Mr. P. N. Langford.
Mr. H. C. Smith.
Mr. W. W. Townsend.

Central Gas Advisory Board.—The following were re-elected to represent the Council on the Central Gas Advisory Board:

Mr. Stephen Lacey.
Mr. J. W. McLusky.
Mr. C. S. Shapley.
Mr. S. Tagg.

Date of Next Meeting.—Following the usual custom, it was decided to omit the meeting of the Board in the month of August. The next meeting of the Board will therefore be held on Sept. 13.

World Power Conference—Vienna Sectional Meeting, Aug. 25 to Sept. 2, 1938.—It was reported that the programme had been published in the Council's Monthly Reports. Three Gas Papers were being presented, dealing with Gas for Small-Scale Industries, prepared by Mr. W. Dieterichs on behalf of the Industrial Gas Centres Committee; Gas for Household Purposes, prepared by Mr. W. J. Sandeman on behalf of the British Commercial Gas Association; and Gas for Public Lighting, prepared by Mr. Davey and Mr. McGibbon on behalf of the Joint Lighting Committee of The Institution of Gas Engineers and the Society of British Gas Industries.

Arrangements were made for the attendance of certain members representing the Gas Industry.

Personal

Mr. B. RAISTRICK, B.Sc., has been appointed to the Gas Light and Coke Company's Gas Research Fellowship at the Imperial College of Science and Technology for one year as from Oct. 1 next, in succession to Mr. M. Maccormac, who completes his second year's tenure of the Fellowship on Sept. 30.

Obituary

Mr. EUSTACE ABEL SMITH, J.P., of Longhills, Lincoln, died in London on Sunday, July 10, at the age of seventy-five. Mr. Abel Smith was the Chairman of the Bryan Donkin Company, Ltd., Chesterfield, and British Furnaces, Ltd.

Mr. Smith was a Director of the Bryan Donkin Company, Ltd., from its reformation in 1906. He was made Vice-Chairman in September, 1921, and was Chairman since May, 1928. He was Alderman of the Kesteven County Council.

The funeral took place at All Saints' Church, Branston, Lincoln, on July 14, when Alderman G. Clark attended. Also present were Mr. R. J. Tucker, Mr. A. G. Webb, and Mr. D. M. Henshaw (Huddersfield), Director of Bryan Donkin Company, Ltd., and British Furnaces, Ltd. A memorial service was held at St. Peter's, Eaton Square, London, at the same time, and the Company was represented by Mr. C. W. Crawshaw. Dr. E. W. Smith, a Director of British Furnaces, Ltd., also attended. Two minutes' silence was observed at the works at the time of the funeral.

News of the Week

An Increase in the price of gas of 5d. per 1,000 cu.ft. is announced by the Denny Town Council.

An Offer by the Newcastle-upon-Tyne and Gateshead Gas Company to provide gas services to 459 houses has been accepted by the Hebburn Urban Council.

Extensions to the Dunbar Gas-Works have reached completion, and the new building faces the main road alongside the works. A spacious window has been provided for the display of fires and cookers.

The First City of Nottingham Exposition was opened on Nottingham Forest on July 13 by the Duke of Portland. The early results of this exhibition, which remains open until Saturday, have already induced the organizers to contemplate making it a yearly event. Among the exhibitors were the Nottingham Gas Department.

Notice is Given, pursuant to the Horley District Gas (Charges) Order, 1922, that as from Oct. 1, 1938, the Horley District Gas Company intend to supply gas of a calorific value of 460 B.Th.U. per cu.ft. to consumers at Felbridge in the Parish of Horne in the County of Surrey in substitution for the quality of 440 B.Th.U. now being supplied.

Twice Daily This Week, from July 19 to 22, free cookery demonstrations are being given by Miss Watson, G.C.D.S. (Cordon Bleu Diploma) in Main's Travelling Showroom at Main Street, Bainsford, Falkirk, under the auspices of the Falkirk Gas Department. The demonstrations were opened by ex-Provost Muirhead, Convener of Falkirk Gas Committee.

The Purchase of Gas in Bulk from the Welsh Navigation Coal Company, Coedely, is the subject of a draft agreement adopted by the Rhondda Council on July 13. The agreement provides that the Company shall supply the Council up to 620,000 cu.ft. a day. The Council, of course, will have to apply to the Board of Trade for the necessary Special Order in due course. The services of about forty of the Council Gas Undertaking's employees will be no longer required, and the Council has agreed that they should have first consideration for vacancies in other municipal departments.

Surprise Was Caused at the Birkenhead Town Council by the announcement that three neighbouring authorities, Bebington Corporation, Neston U.D.C. and Wirral U.D.C., had lodged objection with the Board of Trade, to Birkenhead's proposal to acquire three acres of land to accommodate a new large gasholder. The Chairman of the Gas Committee, Mr. Higson, in emphasizing that the new gasholder was urgently needed, said the unexpected opposition would not succeed in delaying its erection as the Council had sufficient land available to proceed without enquiry by the Board of Trade.

A Copy of the Draft Special Order granted on the application of the Nantwich Gas Company has been received by the Nantwich Rural Council from the Board of Trade. The Order is to make provision for the purchase by the Company of the Gas Undertaking of the Nantwich Urban Council, to extend to the undertakings of the Company certain provisions of the Nantwich Gas Act and Orders, 1903 to 1932, to define the limits of supply, to fix prices for the gas to be supplied, &c. The clerk to the Council was instructed to make representations to the Board of Trade on the question of incorporating additional areas.

Mrs. Eileen Murphy, Home Service Director of the B.C.G.A., visited the Empire Exhibition, Glasgow, on July 11, and delivered an address to a crowded audience in the Gas Pavilion. Mr. W. R. Drummond, Secretary, National Gas Organizations in Scotland, introduced Bailie Mrs. Jean Mann, of Glasgow, who in turn introduced Mrs. Murphy to the audience. Mrs. Murphy, in the course of an interesting talk, said that too many kitchens failed to have a sufficient supply of hot water. There were two million homes in Britain with no hot water system and some three million with no bathrooms. Mrs. Murphy dealt also with refrigerators and gas fires, and, at the close of her address, Mr. J. W. McLusky, Engineer and Manager of the Glasgow Department, proposed a vote of thanks to Bailie Mrs. Mann for presiding, referring to her enthusiasm for better housing and a cleaner atmosphere and for the work she had done to secure these objects.

Gas is Extensively Used in the new Eagle Café, East Pier, Ramsgate, which was officially opened by the Mayor (Alderman W. T. Smith) on July 11, all cooking, water heating, and refrigeration being done by that medium.

Cannon Iron Foundries, Ltd., referring to the illustrations of new flats at Sheffield on p. 97 of last week's "JOURNAL," inform us that the large double cooker shown in the left-hand bottom picture was supplied by them.

The Number of Street Lamps in use in the Gas Light and Coke Company's area has increased from 49,537 in 1932 to 52,430 at the beginning of this year, an increase of 5·8% in the five years, while the number of therms used has increased 21·5%.

Considerable Improvements were carried out during the year ended March 31 in the lighting of Brighouse. The Corporation Gas Department now has the supervision of the whole of the lighting of the newly extended Borough, some 1,680 gas lamps being employed.

The Annual Report of the Chief Inspector of Gas Meters for the City of Nottingham, Mr. C. P. Tatham, shows that 40,280 meters were tested during the year ended March 31, 1938, the percentage of rejections being 5·5. The testing fees amounted to £2,877, with expenditure totalling £2,334.

A Seven-Year Contract for gas lighting has been entered into by the Sherborne U.D.C. for the area under the Council's control. The lighting of Sherborne has been gradually improved during the last few years, and further improvements will be carried out under the contract, which covers nearly 300 gas lamps.

An Increase of 10 million cu.ft. in the gas used for public lighting during the year ended March 31 is reported by the Belfast Corporation Gas Department. The total gas consumed for this purpose was 401 million cu.ft. Most of Belfast's main roads are lighted by modern low-pressure gas lamps of the cluster type.

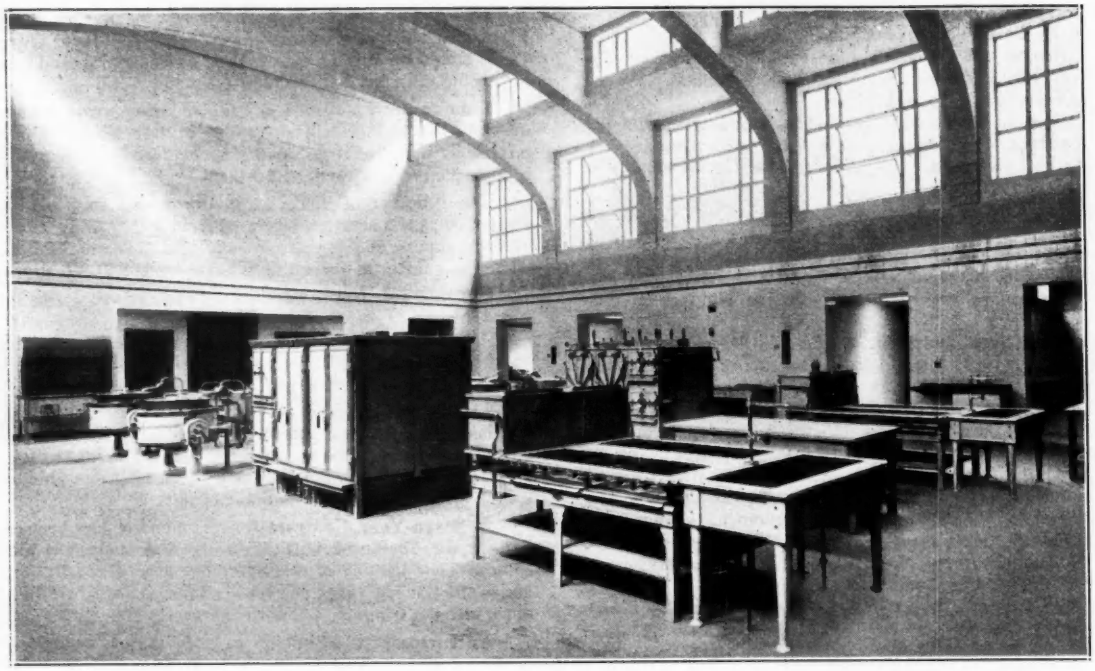
The New Vertical Retorts at Largs are now completed and are producing gas. Councillor Buchanan, Convener of the Gas Committee, gave the first charge of coal to the new plant. It will be recalled by our readers that this installation is housed in a building, turreted after the Scottish Baronial style to harmonize with the architectural amenities of the town.

The Gas Pavilion at the Empire Exhibition is being visited daily by an increasingly large number of persons. Among those who were present at Mrs. Eileen Murphy's recent lecture were a Mrs. Yuille and her sister, Miss Murdoch, direct descendants of William Murdoch, the pioneer of the Gas Industry, whose medallion portrait, kindly lent by Mr. J. W. Napier, of Alloa, hangs in the Gas Pavilion. A pancake-tossing competition has been organized, commencing on July 23 and lasting for a week.

In the Glasgow Corporation Gas Showrooms, Sauchiehall Street, on July 13, Mr. Alexander Bujnowski, Sales and Publicity Officer for the Glasgow Gas Department, handed over to Mr. R. Young, Glasgow Supervisor of the Electrolux sales staff, the Electrolux Permanent Sales Force Trophy, won by Glasgow for producing the largest number of gas refrigerator sales in Britain for the month of June. Mr. W. P. Rae, Scottish Manager for Electrolux, Ltd., introducing Mr. Bujnowski, expressed his appreciation of the co-operation of Glasgow Gas Department since they commenced selling through the Department.

An Interesting Series of cookery demonstrations were held by the Bourton-on-the-Water Gas Company during the week July 5-8, the opening ceremony, which was extremely well attended, being performed by Mrs. J. R. Duff, of Banbury. Demonstrations were given twice daily by Miss E. Sanderson, of the Radiation Research Kitchen, who used a "New World" gas cooker with "Regulo" automatic oven-heat control. There was also a very attractive exhibition of Radiation appliances arranged by the Manager, Mr. C. Pargeter, which included the latest types of cookers, some with self-lighting device. In addition there was also a fine display of the latest types of fires, irons, and water heaters. The inhabitants of Bourton had ample evidence that gas still leads the way in labour-saving and economical domestic appliances.

Gas at the Birmingham Hospitals Centre



Ample provision for present requirements, and at the same time complete facilities for satisfactory adaptation to cover the needs of the future, is the keynote of the Hospitals Centre, Birmingham. Opened on July 14 by Their Royal Highnesses the Duke and Duchess of Gloucester, this is the first Hospitals Centre to be built in Great Britain.

The 150 acre site is well placed, high and healthy, and is removed from noise and smoke. Operating theatres incorporate all the most recent improvements, and special departments provide for all known methods of medical and surgical treatment.

The first part of the scheme consists of (1) The Medical School of the University of Birmingham, (2) Nurses' Home accommodating 300 nurses, and (3) a General Hospital with 500 beds. The scope of this magnificent Centre and the elasticity of the organization which it comprises ensure for it an outstanding success. It may be added that the Centre is a voluntary institution.

The main kitchen has an approximate floor area of 4,150 sq.ft., and it is intended to provide meals for about 1,000 people. A comprehensive range of Radiation gas cooking equipment was chosen for this main kitchen, and also for the wards and the nurses' home. A large number of gas fires, by Messrs. Bratt, Colbran, & Co., Ltd., have been installed in the hospital.

List of Radiation Apparatus.

Main Kitchen.—Two central "oven type" boiling tables with stand extended at one end to accommodate two single compartment "Savoy" grillers. One suite of eight roasting ovens, comprising four large roasting ovens in pairs back to back and four smaller ovens in tiers of two back to back mounted on stand alongside. Two two-pan "Wardour" fish fryers with hoods of stainless steel.

Dietetic Kitchen.—One central battery of "Guesthouse" ovens (three) on stand with boiling table at back and steam Bain Marie at one end on independent stand.

Pastry Annexe.—One boiling table and one double deck pastry oven.

Nurses' Home.—One three-pan "Wardour" fish fryer with hood of stainless steel; two roasting ovens; one double-deck pastry oven; one single compartment "Savoy" griller on stand; and one double "Guesthouse" range with gas-heated Bain Marie at one end.

General.—At other points in the Centre the following Radiation apparatus is also installed: 12 "New World" gas ranges No. 4,033, with "Regulo" control; 3 "New World" gas cookers No. 33, with "Regulo" control; 1 R.2122/1 "Butler" hotcloset (with hotplate) on high stand; and 5 single compartment "Savoy" grillers.

Women's Gas Council

Members from the North Visit London.

On Thursday, July 7, 300 members of the United Kingdom Branch of the Women's Gas Council visited the Neasden Works of Ascot Gas Water Heaters, Ltd.

The party was met at Euston by Miss Halpin and Miss Wilson, of the Women's Gas Council, and by officials of Ascot Gas Water Heaters, Ltd. Ten coaches transported the party to the Brent Bridge Hotel, where they were entertained at lunch. Mr. Leopold Friedman, the Assistant Managing Director, extended a hearty welcome to the largest gathering of ladies that had ever visited the "Ascot" Works and to his knowledge the largest party that had ever come from the North of England to visit manufacturers in the South. Miss Wilson also addressed the party, and this was followed by a short explanation of heating water by gas by Mr. T. B. V. Hirst.

The tour of the Works began at 3 o'clock, when, under the guidance of sixteen representatives, the visitors were given a demonstration and explanation of the processes of manufacture, storage, packing, and delivery of Ascot Gas Water Heaters.

After the inspection of the Works, the ladies again boarded the coaches and were taken by an interesting route to Oxford Street for tea, the guides giving a commentary *en route*. Following tea, the party proceeded on their tour round London, via Oxford Street, Park Lane, Gas Industry House, and on to Buckingham Palace, where the visitors had an opportunity of seeing the debutantes on their way to Court for Presentation. The route continued through Westminster, Parliament Square, past the Cenotaph, along the Embankment, through the City, and past St. Pauls to the Tower of London, where another stop was made. On the return journey the party passed through Fleet Street, the Strand, Trafalgar Square, Piccadilly, and Charing Cross Road back to Euston, where the visitors joined their train for the North after a most interesting and enjoyable day.

INSTITUTION OF GAS ENGINEERS

In our Third Institution Number, June 22, we published the written contributions to the discussions on the Papers presented at the Annual Meeting of The Institution of Gas Engineers, together with the Authors' replies as far as these were available at that time. Two further replies are printed in our issue to-day.

Considerations Upon the Processing of Coal

Communication No. 180

by

E. V. EVANS, O.B.E., F.I.C., M.Inst.Gas E.

(Chairman, Research Executive Committee, Institution of Gas Engineers)

Mr. E. V. EVANS, in reply, wrote: Although this is not the place for a valedictory eulogy, I am glad to say that Professor Cobb has given me the opportunity of saying how much the Gas Industry, and particularly the Research Committees of The Institution of Gas Engineers, owe to his life work at the University of Leeds. Not only are we indebted to him for original investigations of high quality, but we should never have been in the position to contemplate the study and development of new processes had it not been for the presence within the Gas Industry of a body of men trained in the science of fuel technology, and the Industry must never forget how much it owes to Professor Cobb in providing such a body of men. From Professor Cobb's remarks it is clear that his interest in the Gas Industry and in the investigations upon which we are engaged is as vital as ever, and though we may miss him, and miss him greatly, from the Chair of the Livesey Professorship, it is good to know that our efforts will have his sympathetic support.

I should like to thank Dr. E. W. Smith for his reference to the interest which I have taken in the research work of the Institution, but it must be remembered that the wider range of investigations which the Institution is now making has been brought about by the enthusiasm of all the members of the Research Committees. Dr. Smith is undoubtedly correct in his suggestion that if carbon monoxide imparts to gas properties which are of real value—and cheapness is undoubtedly a property of great value—then it will continue to form a constituent of town gas. But in estimating its value the whole of its characteristics should be taken into account. At this point I should like to refer to the reference made by Dr. Smith and other speakers to the value of the revenue from coke in reducing the price of gas. I should not like anything in my Paper to obscure the important fact that coke is to-day our most valuable secondary product. Under certain conditions, such as exist at the coke ovens, coke is the primary product of the carbonizing process, but in towns where coke is sold as a fuel in competition with raw coal it does not seem probable that its value can consistently and appreciably exceed the value, therm for therm, of raw coal. It is for this reason that the contribution that coke can make to the processing charges is likely to be limited in all cases where coke is being sold in competition with raw coal. At the same time, and this deals with a point raised by Dr. King, if the special properties of the fuel or the local circumstances of the Gas Undertaking justify the production of a solid residue there is no doubt that the Gas Industry will continue to make such a product.

I was very pleased to hear Dr. King speak of the high rates of gasification which have been obtained at the Fuel Research Station The high output of gas relative to the reaction space is one of the features which has characterized both the experiments at Leeds and those at the Fuel Research Station, and if we can retain this feature in a commercial process it should be of great value. Dr King has also drawn our attention to the importance of being able to use coals differing widely from those which we use to-day, and I do not think that this important feature should be overlooked at any time in considering the possibilities of complete gasification.

Economic Aspect.

I am obliged to Mr. Hollings for underlining those parts of my Paper in which I warn members against jumping to the conclusion that a new process or processes of gas manufacture had arrived; that time is not yet, and Mr. Hollings was wise in emphasizing that fact. At the same time the immaturity of these new processes makes it difficult to be dogmatic regarding their economic possibilities. A figure quoted by Mr. Hollings of 3d. per therm for pure hydrogen produced by existing processes is a low estimate, but the gasification of coal in hydrogen does not require the supply of pure hydrogen and operation under high pressures does suggest possibilities of effecting appreciable savings in the cost of producing hydrogen sufficiently pure for our purpose. The reaction $C+2H_2O=CO_2+2H_2$ is a simple one and the raw materials required are not costly. There does not appear to be any fundamental reason why a therm of hydrogen should not be produced at a figure appreciably below 3d. Admittedly this is the first step to be made before we can discuss the economics of complete gasification by hydrogenation, and I may say that the Research Committees are not unaware of this fact. I do entirely support Mr. Hollings's view on the necessity for the cheapest gas, but I believe that this is most likely to be attained if we can secure from the thermal energy now sold as coke a price per therm equal to that which we receive from that of the thermal energy sold as gas.

Mr. G. Helps expressed his regret that I have set the signpost at 500 B.Th.U. I do not know that I can accept the responsibility for so doing. The signpost has been set by the custom of the country and the fact that the thousands of miles of mains and the scores of millions of appliances throughout the country are more likely to operate satisfactorily with a gas of 500 B.Th.U. than with one of 200 B.Th.U. If we were starting entirely afresh this story might, although I do not think it would, be materially different.

Dr. Townend has shown us how much this investigation into pressure gasification is work after his own heart, and if the Gas Industry requires technicians trained in high pressure technique I do not think it will be disappointed if it looks to Leeds University to provide them. I was

glad to hear the reference to the oil industry: the story of what that industry has done in treating its raw material to meet the changing demands of the public is a real inspiration. It might have been easier to limit the compression ratio of an aero engine than to produce iso-octane, but in the interest of efficiency the petroleum industry chose the more difficult course.

Mr. Rhead has clearly given much thought to the type of hydrocarbon which he would most like to produce if he had a free hand. Although the Leeds experiments have been so successful in producing methane we must bear in mind that methane is the simplest of the hydrocarbon gases and the likelihood of synthesizing the other and more complex molecules is appreciably less.

I should be sorry if Mr. F. H. Robinson thought that I had overlooked the valuable work which he and others have done upon the complete gasification of coal by combination and modification of existing processes. This was by no means the case, and I would like to make it clear that Section V. of my Paper was not intended as an exhaustive summary of such processes, but merely as a review of the principles involved.

Finally, will you allow me to draw attention to the fact that most of the speakers who took part in the Discussion are members of Committees associated with this problem of methane synthesis under pressure. Such knowledge will enable members of the Institution to judge the vitality of these Committees.

Works Control

Communication No. 185

by

W. HAWKYARD, M.Inst.Gas E., M.I.Chem.E.

(Works Engineer, Willoughby Lane Works, Tottenham and District Gas Company)

Mr. W. HAWKYARD, in reply, wrote: In replying to the questions raised in the course of the Discussion on this Paper, I wish to say how gratified I was by the manner in which it was received, and for the very kind remarks which Dr. E. W. Smith made in opening the Discussion.

Regarding electro detarrers, Dr. Smith raised the question as to whether any estimate of the saving due to reduction in the back pressure had been made. It would be very difficult to give any estimate in power saving due to this reduction, but in the case of the intermittent vertical section purifiers it has been noticed repeatedly that within 48 hours of the detarrer being shut down there is an increase in back pressure varying from 2 to 4 in. w.g. This increase in pressure appears to be due to the formation of a relatively impervious layer on top of the oxide in the first purifier of the series. These purifiers work on the downward system. On the water gas stream, before the detarrer was put to work, boxes were being constantly changed through excessive back pressure in the first box. Since the installation of the detarrer, however, this back pressure has not been experienced.

I am pleased to note that both Dr. E. W. Smith and Mr. E. G. Stewart agree that our practice of placing the detarrers immediately following the exhausters is best. The requirements of every Works must be taken on their own merits, but in each case the following main reasons decided the position at Tottenham:

(*a*) At the exhauster outlet the gas is under pressure, and therefore a leak in the detarrer casing will then not be dangerous and will be more readily detected.

(*b*) Where the hot gas is rapidly condensed and the particle size of the tar fog is consequently small, it is an advantage to have the detarrer as far as possible from the condenser so that natural coagulation of the tar particles can take place.

At the Tottenham Works most of the exhausters are of the Connersville type, but where a Works has exhausters of the blade type I should say, without hesitation, that it would be very desirable to have the detarrer at the outlet of the exhausters in order to enable the tar coming forward to assist in the lubrication of the exhausters.

Cost of Steam Raising.

In Mr. A. L. Holton's contribution the cost of steam raising is asked for and the amount of steam raised from waste heat boilers. The cost of steam raising was omitted from the Paper, as it was thought that the inclusion of such figures would have been of doubtful utility inasmuch as costs of this nature vary so widely in different parts of the country and on different Works, due to such factors as the price charged for solid fuel, &c. For Mr. Holton's information I may say that the all-round cost of the steam produced from waste heat boilers and solid fuel-fired boilers combined is in the neighbourhood of 2s. 6d. per ton. The weight of steam raised from the intermittent vertical retort house is 12,000 lb. per hr., and from the continuous vertical retort house 10,400 lb. per hr. The figure from the continuous vertical retort house is not so good as it might be owing to these being old type boilers, whilst the boilers on the intermittent vertical section are of the more modern fire tube type.

Mr. Holton also asks about the moisture in coke. The normal moisture content aimed at is 5 to 7 per cent. In the case of the intermittent vertical large coke it rarely exceeds 5 per cent., which is regarded as a minimum to avoid trouble from dust. Reference is also made to the difficulties likely to arise in endeavouring to change from one colliery to another. The changes of coal which we found necessary were made a year or two ago, previous to the introduction of the selling organization, but, even so, provided a change is necessary on account of the quality, according to assuranes given in Parliament, no difficulty should arise.

Coal blending is not practised at Tottenham, and I therefore am unable to give any information concerning the results of using blended coal.

With regard to producer fuel, scalpings between $\frac{3}{4}$ in. and $1\frac{3}{4}$ in. are used. The work which is being done on the cracking zone of the intermittent vertical retorts is not yet completed, but I can say that the cracking space has been increased, with advantage, to approximately 30 in. of free space after carbonizing.

Mr. Holton mentions that there is no detarrer on the continuous vertical gas stream. This house is nearly due for reconstruction, and the provision of an electrical detarrer has been deferred until that time.

The detarrers have not yet been in commission long enough to enable any definite statement to be made regarding their effect on tar in oxide, or upon gum formation, but, as previously stated, the back pressure in the purifiers is noticeably less when the detarrers are at work. So far as gum is concerned, it is only possible to say that no increase in complaints has been reported.

Mr. E. G. Stewart has asked for a definition of reasonable temperature in actual degrees. By reasonable temperatures was implied that the temperatures must always be kept well within the makers' recommendations. In the case of the intermittent plant at Tottenham, the bottom flues are maintained at 1,360° C. and the tops at 1,060° C. These temperatures have been adhered to rigidly throughout the whole life of the setting, which has been in constant commission for $4\frac{1}{2}$ years.

Control of Gas Making.

With regard to the control of gas making in different sections to conform to the output, the statement that the minimum water gas is made must be accepted with a reasonable margin for the general requirements of good working. No attempt is made to sacrifice retort house efficiency in order to save a relatively small volume of water gas. Mr. Stewart asks about balancing of the makes during the low consumption periods, such as August

and Christmas. As was pointed out in the Paper, the Tottenham Works is fortunate in the size of its units. The retort repair schedule is worked out so that it can be visualized for the oncoming 10 years, and one half of a retort house is shut down every year for either repairs or resetting. This drop in the summer months has been found to be sufficient when allowance is made for the balancing effect of water gas. During the very slack periods, such as August and Christmas, it is sometimes found necessary to leave off a few extra retorts for scurfing in the continuous vertical retort house. In no period during the past 10 years has any section of retort plant been put on slow fires.

Mechanically-operated carburetted water gas plants are mentioned, but it is obvious that large units would be of no possible use to a Works of this size with the present price of coke and oil, and the existing sets are quite ample for present requirements.

Mr. Stewart has raised the question of calorific value of the continuous vertical gas which is shown as 521. This figure appears in the thermal balance-sheet, and was rather an exceptional figure. In the week shown on this balance-sheet there was a large quantity of a certain Yorkshire coal coming in, and this was put to the continuous vertical retort house. This coal is one which will not steam at all well, hence the higher calorific value.

Regarding painting, it is considered that any extra cost due to painting yearly is covered by the better appearance of the ironwork, and by the fact that corrosion is noticed earlier than would be the case with 3-yearly painting.

Mr. Stewart also asks for further information regarding the voluntary brigades. The three brigades are made up solely by volunteers from the Company's employees. All uniforms and equipment are provided by the Company, and drills, lectures, &c., are held in the Company's time. No payments are made other than that the Company gives each member £1 at the end of every year.

With regard to the costing system, Mr. Stewart can rest assured that the figures and graphs prepared in connexion with the costing system have been reduced to an absolute minimum. These are not elaborate sets of statistics, but merely necessary working costs which, in any case, had to be obtained for our system. They are made up in such form that the busy man can see at a glance what the cost of manufacture is. The point is also raised that interest, depreciation, salaries, and similar overheads are not included in the "Cost into Holder" returns. It has always been considered that interest and depreciation (at any rate after the capital has been expended) are rigid charges largely outside normal control. They can, of course, be added if required, and indeed frequently are included in particular calculations. We prefer, however, not to cloud the issue by including them regularly with costs which are subject to definite control. Again, with salaries and similar overheads it is difficult to decide where to draw the line. Here, the utility of a Works Costing system is considered to rest largely on its capacity as a medium for comparison, and every care is taken to preserve this factor. A figure for salaries is naturally available, but a considerable proportion of it must consist of an allocation that is to some extent arbitrary. The method of allocating re-setting costs is also a point on which opinions vary. At Tottenham they are compiled separately and included as a footnote to the "Cost into Holder" statement of the section concerned. Reference to the Annual Works Reports therefore enables them to be speedily averaged over a period of years.

Mr. Stewart's point regarding costing to a uniform calorific value is, of course, forceful. However, at Tottenham our range is nothing like so wide as 400 to 540 B.Th.U. Furthermore, the effect of stripping the gas for benzole brings the calorific values reasonably into line, and we have therefore never considered it worth while to adopt this refinement.

Mr. Stewart pleads for a larger unit for costing purposes, and states that ·01d. per therm seems a small amount and not worth examining, but surely this is only a case of relativity, and ·01d. per therm means just as much as 4s. 2d. per 5,000 therms. The gas is sold at so much per therm, and it is less confusing, when building up costs, to see them tabulated as so much per therm than in the much larger unit that Mr. Stewart would like to see. From the manufacturing side it is equally easy to compare either large or small units. However, effort has been made to avoid over-elaboration, yet at the same time nothing of importance has been left out in the preparation of the costs and graphs.

Dr. J. G. King says in his contribution that no doubt we have a great deal of valuable information as to the behaviour of different types of coal in both continuous vertical retorts and intermittent vertical chambers. A considerable number of coals have been tested in batches of over 1,000 tons, but in a Paper of this description it is very difficult to decide what to put in and what to leave out, so these tests were not mentioned. This information could very well be given by a method suggested by Dr. E. W. Smith in his closing remarks. No blends of coal are used, but different classes of coal are allocated to the two types of retort houses. This is rendered necessary by the fact that the continuous vertical retort house is called upon to supply a coke suitable for domestic purposes. Dr. King says that the Fuel Research Board has records from which it would be possible to decide whether any given coal would be suitable for use in our work. This would certainly be the case in the intermittent vertical retorts, but in the case of the continuous vertical retorts it would not be so simple. I have in mind one particular coal equally suitable for both houses so far as travel and ease of working is concerned, but in the continuous vertical retort house this will not steam.

Fatal Accident at a Gas-Works

We are indebted to Mr. F. C. Briggs, Engineer and Managing Director of the Dudley, Brierley Hill and District Gas Company, for the following account of an accident which occurred at his Company's Works on July 11.

The gas governor in the exhauster-compressor house required cleaning. One of the works mechanics, Mr. A. Round, was proceeding to do this under the supervision of the Works Superintendent, Mr. A. V. North. The governor had been opened. There was an escape of gas which exploded and became ignited. In endeavouring to extinguish the flames the mechanic and the Works Superintendent were badly burned. The former is still in the Dudley Guest Hospital. The latter, unfortunately, succumbed to his injuries.

In endeavouring to prevent the spread of the danger the Works Superintendent cut off the gas supply to the town temporarily. The supply was turned on again within approximately ten minutes, but owing to the cessation difficulties continued in some districts for longer. The only material damage that occurred on the Works was the burning of the woodwork of the roof of the building, the breaking of windows and doors, and the damage to the plaster of the walls caused by the fire.

Athletic and Social

Hampton Court Sports.

The Hampton Court Gas Company Athletic Club held their first Garden Party for members and their friends on Saturday in the Sports Ground and new Club House recently given them by the Board of Directors. The afternoon started with children's sports at 2.45 p.m., and at 5 p.m. some 200 members and their friends sat down to tea on the lawn in front of the Club House. It was very gratifying to the members' wives, who had worked so hard in preparing refreshments, to find their labours had not been in vain. At the conclusion of tea, Mrs. C. T. Price, wife of the Engineer and General Manager, presented the prizes for the children's sports. After that some very amusing athletic events were keenly contested by the adults, the winners also receiving their prizes from Mrs. Price, who with her husband and their children had spent the whole afternoon and evening with the employees. A hearty vote of thanks to the Directors and Mr. and Mrs. Price for the work they had done to make the party so enjoyable and successful was followed by a light supper for the adults in the Club House and the evening was brought to a happy close with dancing on the tennis courts.

The Institution of Gas Engineers

RESULTS OF 1938 EXAMINATIONS

The undermentioned Candidates were successful in the 1938 Examinations in Gas Engineering (Manufacture), Gas Engineering (Supply) and Gas Supply of The Institution of Gas Engineers, held under the Education Regulations of The Institution of Gas Engineers, as approved by the Government Education Departments of Great Britain and Ireland, and the City and Guilds of London Institute.

The Results do not include Candidates (*a*) who withdrew before the Examination, or (*b*) who, having Second Class Certificates, re-sat and failed to secure First Class Certificates, or (*c*) whose Examination has not been completed.

Appended is the Report of the Board of Examiners on the 1938 Examinations.

Comparative Statistical Schedule of the 1937 and 1938 Examination Results.

Examinations.	1937.					1938.				
	First Class with Distinction.	First Class.	Second Class.	Failed.	Total.	First Class with Distinction.	First Class.	Second Class.	Failed.	Total.
External—										
Diploma in Gas Engineering (Manufacture) ..	—	4	1	1	6	—	6	10	9	25
H.G. Gas Engineering (Manufacture)	—	8	13	5	26	—	6	17	5	28
O.G. Gas Engineering (Manufacture)	1	5	8	14	28	—	3	19	14	36
O.G. Gas Engineering (Manufac.) (single subject)	—	—	—	—	—	—	1	2	—	3
Diploma in Gas Engineering (Supply)	—	1	2	—	3	—	1	—	2	3
H.G. Gas Engineering (Supply)	—	—	—	—	—	—	9	6	1	16
H.G. Gas Supply	—	6	5	1	12	—	—	—	—	—
Certificate in Gas Supply	—	—	—	—	—	—	2	3	1	6
O.G. Gas Engineering (Supply)	—	7	22	8	37	3	7	10	5	25
O.G. Gas Engineering (Supply) (single subject)	—	9	5	—	14	—	9	3	1	13
Internal—										
H.G. Gas Engineering (Manufacture)	1	8	21	11	41	—	9	24	11	44
O.G. Gas Engineering (Manufacture)	1	5	38	11	55	5	15	18	14	52
O.G. Gas Engineering (Manufac.) (single subject)	—	5	6	1	12	—	4	3	1	8
H.G. Gas Engineering (Supply)	—	—	—	—	—	4	7	8	12	31
H.G. Gas Supply	4	14	26	14	58	—	1	2	—	3
Certificate in Gas Supply	—	—	—	—	—	—	4	36	8	48
O.G. Gas Engineering (Supply)	3	13	42	33	91	8	24	61	43	136
O.G. Gas Engineering (Supply) (single subject) ..	2	6	6	—	14	4	4	3	—	11
Total	12	91	195	99	397	24	112	225	127	488

EXTERNAL CANDIDATES (110).

Diploma in Gas Engineering (Manufacture) (16).

Class.	Name.	Town.	Subject of Thesis.
First ..	Bates, E.	Stalybridge ..	"The Operation of Intermittent Vertical Chamber Ovens Combined with Coke Dry Cooling Plant".
,, ..	Calvert, N. ..	London	"Some Considerations Affecting the Working of Step-Grate Producers with Steam-Air Injectors".
,, ..	Garner, L. F. ..	Hitchin	"Gas Production from a 1¼ Million/Day Horizontal Retort House".
,, ..	Hemingway, C. W.	Shipley	"The Theory and Practice of Wet Purification".
,, ..	Malsbury, J. ..	Hertford	"The Control of Gas Manufacture".
,, ..	Tomes, J. A. ..	Walsall	"Practical Considerations Affecting Results in Continuous Vertical Retorts".
Second ..	Anderson, E. C. ..	Birkenhead ..	"The Generation and Distribution of Steam at a Gas Works with Particular Reference to Producer Gas Fired Boilers".
,, ..	Bentley, S. C. ..	Leicester ..	"Gas Works Foundations, with Specific Examples".
,, ..	Deacon, V. H. ..	Birmingham ..	"The Application of Oxy-Coal Gas Welding to Repairs of Retort Settings".
,, ..	Fox-Andrews, J. S.	Bristol	"Some Aspects of C.W.G. Tar Emulsions".
,, ..	Gledhill, W. M. ..	Stirling	"The Selection and Design of Coke Screening Plant".
,, ..	Horner, A. S. ..	Wallasey	"The Compression of Coal Gas (up to 5,000 lbs. per square inch) and its Uses".
,, ..	Mitchell, A. A. ..	Dunfermline ..	"Producer Fuel".
,, ..	Siddons, V. J. J. ..	Sheffield	"Engineering Technology in the Utilization of Coke Oven Gas by Gas Undertakings".
,, ..	Wainwright, A. V.	Shrewsbury ..	"The Effect of a New Source of Water Supply on Boiler Water Treatment".
,, ..	Warne, G. G. ..	Portsmouth ..	"The Preparation and Ignitability of Coke".

Higher Grade Certificate in Gas Engineering (Manufacture) (23).

Class.	Name.	Town.
First	Ashton, J. H. F.	Preston
,, ...	Ault, D. W.	London
,, ...	Bowles, F.	Bristol
,, ...	Horrod, S. A. J.	Swindon
,, ...	Hudson, R. A.	London
,, ...	Jones, K. E.	Stoke-on-Trent
Second	Anderson, J. A.	Edinburgh
,, ...	Bain, L.	Glasgow
,, ...	Benstead, T. W.	Slough
,, ...	Brearley, N.	Elland
,, ...	Cole, G. H.	London
,, ...	Hearsey, E.	Worthing
,, ...	Hindle, C.	Nelson
,, ...	Holmes, A. E.	Middlesbrough
,, ...	John, H.	London
,, ...	Johnson, W. H.	Aldershot
,, ...	Nelson, L.	Hull
,, ...	Robson, F. L.	Sheffield
,, ...	Shillington, T. F.	Helen's Bay
,, ...	Stevenson, J.	Leek
,, ...	Watson, T.	Rushden
,, ...	Westmacott, M. H.	Sunningdale
,, ...	Wright, L. S.	Stoke-on-Trent

Ordinary Grade Certificate in Gas Engineering (Manufacture) (22).

Class.	Name.	Town.
First	Gaston, A. G. A. M.	Portsmouth
,, ...	Payne, E. K.	Reading
,, ...	Porter, S. C.	Ipswich
Second	Baker, J. L. H.	Emsworth
,, ...	Barber, F. J.	Tunstall
,, ...	Blakeley, H. J.	Preston
,, ...	Blenkhorn, T. H.	Blackburn
,, ...	Bursey, R. R. H.	Exmouth
,, ...	Clayfield, J. A.	Cirencester
,, ...	Clennett, R.	West Hartlepool
,, ...	Crane, K. J.	Shrewsbury
,, ...	Dent, T. N.	Bristol
,, ...	Ellis, F. C.	Torquay
,, ...	Higgs, F. C.	Swindon
,, ...	Ireland, J. L.	Hessle
,, ...	Lawler, E. S.	Brighton
,, ...	Magson, J. H. H.	Dorchester
,, ...	Mitchell, F. J.	Aylesbury
,, ...	Seager, A. C.	Southend-on-Sea
,, ...	Shortland, G.	Grimsby
,, ...	Thompson, J.	Halifax
,, ...	Witcombe, H. F.	Rhondda

Ordinary Grade (Single Subject) Examination in Gas Engineering (Manufacture) to qualify to sit for the Diploma Examination in Gas Engineering (Supply) (1).

Class.	Name.	Town.
First	Manning, C. W.	Bristol

Diploma in Gas Engineering (Supply) (1).

Class.	Name.	Town.	Subject of Thesis.
First	Walsh, J. B.	Stockport	"The Co-ordination of High and Low Pressure Supplies".

Higher Grade Certificate in Gas Engineering (Supply) (15).

Class.	Name.	Town.
First	Beech, R.	Kidsgrove
"	Brown, K. E. B.	Loughborough
"	Bujnowski, A.	Glasgow
"	Denton, J. W.	Torquay
"	England, A.	Blackpool
"	Marwick, J. A.	Portsmouth
"	Sheldrake, T. W. S.	Kingston
"	Smith, J.	Hinckley
"	Sullivan, H. D.	Plymouth
Second	Clayton, R. S.	Hereford
"	Croad, G.	Hebden Bridge
"	De Quincey, W. B.	Norwich
"	Goodwill, J. L.	Dudley
"	Hoadley, E. J.	Herne Bay
"	Johnson, F. J.	Bristol

Certificate in Gas Supply (5).

Class.	Name.	Town.
First	Kenworthy, H. W.	Matlock
"	Smith, W. J.	Romford
Second	Aitken, R. A.	Montrose
"	Bairstow, R.	London
"	Craven, F.	Cleveleys

Ordinary Grade Certificate in Gas Engineering (Supply) (20).

Class.	Name.	Town.
First	*Ashworth, S.	Darwen
"	*Brandon, J. E.	Great Yarmouth
"	Casson, L.	Halifax
"	Cornish, K. C.	Plymouth
"	Henry, J. A.	Doncaster
"	Horrod, S. A. J.	Swindon
"	*Shilson, A. C.	Weston-super-Mare
"	Sloman, K. F.	Plymouth
"	Spry, J. G. T.	"
"	Witcombe, H. F.	Rhondda
Second	Clegg, V. E.	Cuckfield
"	Eastabrook, E. K.	Portsmouth
"	Ellis, F. C.	Torquay
"	Kitchen, R. W.	Lincoln
"	Osborne, W. J.	Portsmouth
"	Pedler, T. W.	Alphington
"	Rider, K.	Nottingham
"	Tunnicliff, K.	Malvern
"	Verral, B. H.	Southwick
"	Warrillow, J. S.	Shelton

* With Distinction.

Ordinary Grade (Single Subject) Examination in Gas Engineering (Supply) to qualify to sit for the Diploma Examination in Gas Engineering (Manufacture) (9).

Class.	Name.	Town.
First	Beake, R. C.	Bath
"	Ironside, R. S.	Chippenham
"	March, J. D.	Bath
"	Preston, W.	Skipton
"	Renshaw, A. K.	Hale
"	Richardson, P. G.	Saltash
"	Sanders, M. J.	Newton Abbot
"	Wardle, B. W.	Nottingham
"	Weston, P. S.	Bath

INTERNAL CANDIDATES (237).

Higher Grade Certificate in Gas Engineering (Manufacture) (33).

Class.	Name.	Centre.
First	Baxendale, J. de V.	Bradford
"	Bentley, G. A.	Huddersfield
"	Chambers, K. E.	Birmingham
"	Dickson, A. E.	Sheffield
"	Gaunt, J. G.	Bradford
"	Green, J. H.	"
"	Lodge, F. E.	Leeds
"	Simpson, O. J.	Birmingham
"	West, D. E.	Cardiff
Second	Angles, D. B.	Kirkcaldy
"	Baker, M.	Birmingham
"	Barrington, A. H.	"
"	Beaumont, H.	Sheffield
"	Fender, B.	Sir John Cass
"	Gowthrope, H.	Sheffield
"	Hartley, M. L.	Leeds
"	Heaton, A.	Huddersfield
"	Heycock, D. J.	Cardiff
"	Hogley, C. A.	Huddersfield
"	Jordan, R. E.	Sir John Cass
"	Leigh, G. T.	Birmingham
"	Litler, F.	Bradford
"	Mitchell, W. P.	Glasgow
"	Munslow, K. J.	Birmingham
"	Nauen, J. A.	Sir John Cass
"	Passmore, H. G.	Birmingham
"	Peace, G.	Sheffield
"	Spence, G. R.	Leeds
"	Spray, P. H. G.	Cardiff
"	Waterhouse, J.	Huddersfield
"	Whitehouse, R. S.	Birmingham
"	Williams, J. A.	Regent Street
"	Wilson, R.	Sheffield

Ordinary Grade Certificate in Gas Engineering (Manufacture) (38).

Class.	Name.	Centre.
First	Allan, H.	Dundee
"	Ball, C. H.	Birmingham
"	Brock, A.	Glasgow
"	Butchart, J. P.	Dundee
"	*Cobb, G.	"
"	Crane, H. V.	Regent Street
"	Ernest, K. M.	Cardiff
"	Heley, W. G.	Bradford
"	Henderson, R.	Dundee
"	Jarrett, L. W.	Regent Street
"	*Long, R.	Bradford
"	Maw, F. H.	Huddersfield
"	Norrie, F. B.	Dundee
"	Pawley, R. F. D.	Plymouth
"	*Payne, A. J.	Westminster
"	Pike, W. E.	East Ham
"	*Randell, R. J. A.	Westminster
"	*Sage, E. R.	Dundee
"	Webb, A.	Birmingham
"	Wood, G. C.	Edinburgh
Second	Aveyard, C.	Bradford
"	Copsey, L.	Regent Street
"	Cutler, W. J.	" "
"	De Russett, J. D.	Westminster
"	Gare, L. W.	Sir John Cass
"	Grayson, E. J.	Sheffield
"	Harley, R. F.	Edinburgh
"	Henderson, D. M.	Dundee
"	Knowles, R. G.	Bradford
"	McPherson, J. G. C. T.	Dundee
"	Milligan, J. S.	Bradford
"	Noble, G.	East Ham
"	Portchmouth, A. P.	Regent Street
"	Poulson, R. A.	Cardiff
"	Pringle, T. G.	Edinburgh
"	Roberts, M.	East Ham
"	Smith, J.	Dundee
"	Wilkinson, B.	Regent Street

* With Distinction.

Ordinary Grade (Single Subject) in Gas Engineering (Manufacture) to qualify to sit for the Diploma Examination in Gas Engineering (Supply) (4).

Class.	Name.	Centre.
First	Brewer, F. J.	Westminster
"	Catley, G.	Huddersfield
"	Nichols, F. W.	Plymouth
"	Parnall, W. M.	Westminster

Higher Grade Certificate in Gas Engineering (Supply) (19).

Class.	Name.	Centre.
First	Buckley J. A.	Westminster
"	*Coltman, R. F.	"
"	Davis, K.	Tunstall
"	Grammer, J. M.	Westminster
"	Higgs, A.	Tunstall
"	*Junkison, N. R.	Westminster
"	Munns, R. M.	"
"	*Ramsey, C. M.	"
"	Salusbury, R. C. W.	"
"	*Scott, N. G.	"
"	Woolidge, R. A.	"
Second	Butler, C. W.	Birmingham
"	Davies, N. G.	Westminster
"	Findon, W. H. C.	"
"	Holdaway, J. W.	"
"	Hunt, J. R.	Birmingham
"	Morland, R.	Westminster
"	Sayer, W. H.	"
"	Warrick, J. P.	"

* With Distinction.

Certificate in Gas Supply (40).

Class.	Name.	Centre.
First	Buxton, R. W. C. O.	Westminster
"	Chater, R. A.	East Ham
"	Houston, W. T.	Westminster
"	O'Neill, R. H.	Newcastle-upon-Tyne
Second	Adkins, H. B.	Birmingham
"	Bennett, L.	Westminster
"	Bish, H. G.	"
"	Brown, F. A.	Wandsworth
"	Brownlee, J.	Newcastle-upon-Tyne
"	Carr, J.	" " "
"	Cook, J. B.	Wandsworth
"	Curle, H.	Newcastle-upon-Tyne
"	Easterbrook, A. G. S.	Wandsworth
"	Edkins, H. A.	Birmingham
"	Ellis, R. P.	"
"	Evans, J. H.	"
"	Garnham, D. W.	Westminster
"	Goldsmith, F. G.	East Ham
"	Groves, D. F. W.	Westminster
"	Hamer, E. J.	"
"	Henrys, R. E.	"
"	Kimber, M. S.	"
"	Laidlaw, J. A. M.	"
"	Layton, W. H.	"
"	Mance, W. H.	"
"	March, R. W.	Wandsworth
"	Marson, E. H.	Westminster
"	Martin, L. G.	"
"	Medhurst, W. E.	"
"	Paxton, T. J.	Newcastle-upon-Tyne
"	Penfold, G. C.	Wandsworth
"	Riley, H. P.	Westminster
"	Robinson, R. F.	"
"	Ross, T.	Kirkcaldy
"	Sansom, W. H.	Westminster
"	Spencer, C. J. A.	"
"	Thompson, H. J.	Tunstall
"	Watson, S. A.	Newcastle-upon-Tyne
"	West, C. E. C.	Westminster
"	Wilson, J.	Bradford

Higher Grade Certificate in Gas Supply (3).

(Withheld from 1937).

Class.	Name.	Centre.
First	Bremner, H. J.	Westminster.
Second	Heasman, H. V.	"
"	Smith, A. C. D.	"

Ordinary Grade Certificate in Gas Engineering (*Supply*) (93).

Class.	Name.	Centre.
First	Apsey, E. W.	Bristol
"	Arthurs, B.	Westminster
"	Bottom, D. G.	"
"	Brock, A.	Glasgow
"	Carter, J. R.	Liverpool
"	*Caswell, T. M.	Westminster
"	Dancy, L. H.	"
"	*Davis, A. W.	East Ham
"	*Dawson, A. B.	Leeds
"	Folkes, V. S. A.	East Ham
"	*Goodwin, G. H.	Hull
"	Hardie, E. R.	Newcastle-upon-Tyne
"	*Hayes, D. H.	Westminster
"	Heigham, T. C.	"
"	Henderson, R.	Dundee
"	Jackson, J. H. C.	Westminster
"	Johnston, R. E.	"
"	Kirkbright, R. W.	Bradford
"	*Knowles, A. E.	Huddersfield
"	Meek, H. D.	Blackpool
"	Nicholson, T. A.	Bristol
"	Osborne, G.	Cardiff
"	Rhodes, R. P.	Westminster
"	Smith, D.	Leeds
"	Steel, J. E.	Westminster
"	Stokes, J. L.	"
"	*Targett, H.	"
"	Tubman, E. J.	"
"	*Walker, A.	Glasgow
"	Willgoss, G. E.	Westminster
"	Wood, G. G.	Edinburgh
"	Wood, J. W.	Wandsworth
Second	Armitage, S.	Bristol
"	Arnold, J. E.	Huddersfield
"	Bartram, R.	Newcastle-upon-Tyne
"	Bates, K.	Huddersfield
"	Batty, G.	Newcastle-upon-Tyne
"	Beech, G.	Birmingham
"	Bettany, K.	Tunstall
"	Boothroyd, L.	Huddersfield
"	Boyden, W. H.	Westminster
"	Broadhurst, E.	Birmingham
"	Brook, G.	Leeds
"	Brooks, T. W.	Birmingham
"	Brown, B. D.	Bristol
"	Buckham, S. G.	Brighton
"	Burden, J. E.	Birmingham
"	Cann, B. W.	East Ham
"	Caryl, H. A.	Liverpool
Second	Colbeck, J.	Westminster
"	Cole, R. F.	Birmingham
"	Eames, S. W.	South East London
"	Edwards, M. B.	Wandsworth
"	Ellis, S. E.	"
"	Ford, M. F.	Liverpool
"	Foster, E. D.	Huddersfield
"	Foulis, D.	Liverpool
"	Gardner, C. F. C.	Birmingham
"	Greenway, N. H.	Cardiff
"	Harley, R. F.	Edinburgh
"	Harrison, L. W.	Westminster
"	Hawkesley, K. L.	Bradford
"	Heugh, O. J. J.	Westminster
"	Higham, C. A.	Blackpool
"	Holden, E. T.	Westminster
"	Jenks, F. R.	Birmingham
"	Johnson, R. H.	Newcastle-upon-Tyne
"	Judd, L. H.	Westminster
"	Kelly, C.	South East London
"	Kyle, D.	Glasgow
"	McLeish, J. M.	Dundee
"	Martin, J. A.	Hull
"	Mason, H. W.	Wandsworth
"	Norman, C. S.	Hull
"	Owen, S.	"
"	Parker, F. G.	Brighton
"	Parkinson, N. P.	Leicester
"	Pintoff, G. I.	Westminster
"	Pringle, T. G.	Edinburgh
"	Rashbrook, S. F.	Wandsworth
"	Rawlings, A. W.	Westminster
"	Rodley, A.	Southend-on-Sea
"	Rogers, G. B.	Bristol
"	Sealey, D. R.	"
"	Skinner, L. F.	Westminster
"	Smith, J.	Dundee
"	Strafford, G. E.	Newcastle-upon-Tyne
"	Thompson, G. H.	Huddersfield
"	Thorpe, J. H.	Westminster
"	Tonge, A.	Huddersfield
"	Webb, B. E.	Westminster
"	Wheeler, R. F.	"
"	Wilson, W. M.	Glasgow

* With Distinction.

Ordinary Grade (*Single Subject*) *Examination in Gas Engineering* (*Supply*) *to qualify to sit for the Diploma Examination in Gas Engineering* (*Manufacture*) (8).

Class.	Name.	Centre.
First	Chambers, K. E.	Birmingham
"	Cox, C. P.	Westminster
"	*Gale, W. A.	Birmingham
"	Hollingworth, R. A.	Blackpool
"	*Newsome, M.	"
"	*Robinson, C. F.	Westminster
"	*Shadbolt, W. R. S.	East Ham
"	Shipley, T. W. E.	Derby

* With Distinction.

1938 REPORT OF THE BOARD OF EXAMINERS

The Board of Examiners has pleasure in submitting to the Gas Education Committee, for presentation to the Council of The Institution of Gas Engineers, its Report on the 1938 Examinations held under the Education Regulations of the Institution, as approved by the Government Education Departments of Great Britain and Ireland and the City and Guilds of London Institute.

During the year 1937-38, the members of the Board of Examiners and the Assessors, appointed by the Council were:—

Major Courses.

Examiners: Robert Robertson, M.Inst.C.E. (Bristol)—Chairman; J. M. Campbell, J.P. (Margate), T. Carmichael, J.P., M.Inst.C.E., M.I.Mech.E. (Portsmouth), E. Crowther, M.Eng., A.M.Inst.C.E. (Manchester), H. Moys, B.Sc., A.M.Inst.C.E. (London), F. H. Vince (London), and S. E. Whitehead, B.Sc., M.I.Mech.E. (Southampton) — Gas Engineering (Manufacture). W. A. Bishop (Croydon), D. Chandler (London), W. Dieterichs (London), H. J. Escreet, B.Sc., A.M.Inst.C.E. (London), J. A. Gould, M.C. (London), H. R. Hems (Birmingham), E. F. Keable (Great Yarmouth), and W. L. S. Spinks (Birmingham)—Gas Engineering (Supply).

Assessors: England and Wales: S. E. Whitehead, B.Sc., M.I.Mech.E. (Southampton) — Gas Engineering (Manufacture); W. A. Bishop (Croydon)—Gas Engineering (Supply). West of Scotland: David Fulton (Helensburgh) and A. McDonald, B.Sc. (Motherwell)—Gas Engineering (Manufacture) and Gas Engineering (Supply). East of Scotland: J. Jamieson (Edinburgh) and J. W. Napier (Alloa)—Gas Engineering (Manufacture) and Gas Engineering (Supply).

Minor Courses and Gas Fitting Courses.

Examiners: S. E. Whitehead, B.Sc. (Southampton)—Gas Works Practice; E. F. Keable (Great Yarmouth)—Gas Supply Practice; R. N. LeFevre (London), A. G. R. Kennett (Margate), and J. Robertson (London)—Gas Fitting; G. W. Hefford (St. Leonards-on-Sea)—Elementary Science.

ROBERT ROBERTSON,
Chairman,
Board of Examiners.

W. T. K. BRAUNHOLTZ,
Secretary,
The Institution of Gas Engineers.

1, Grosvenor Place,
London, S.W.1.
29*th June*, 1938.

Gas Engineering (*Manufacture*)—*Ordinary Grade.*

The average standard of the work submitted by Internal Candidates for the Ordinary Grade Certificate in Gas Engineering (Manufacture) was good, but in many cases the Candidate failed to read the question carefully. Candidates on the whole appeared to be more familiar with chemical and process matters than with constructional and engineering details. It was evident from the similarity of the answers given by a number of candidates to the same question that some of the Examiners had set questions on the matters which they had dealt with in considerable detail in their lectures. It would appear that the setting by an outside Examiner of one Examination Question Paper for the whole country would tend to a more uniform estimate of the ability of the Candidates.

The Papers submitted by External Students in Ordinary Grade Gas Engineering (Manufacture) were of quite good

standard. Many Candidates' answers were too lengthy, often due to a careless reading of the question.

Gas Engineering (Manufacture) Higher Grade.

The average standard of the work submitted by Candidates for the Higher Grade Certificate in Gas Engineering (Manufacture) was good, although there were few outstanding Papers. It was evident from the work submitted that the Courses of Instruction given by the majority of Instructors had been well balanced.

Gas Engineering (Manufacture)—Diploma Grade.

The answers submitted by Candidates for the Diploma Examination in Gas Engineering (Manufacture) were fairly good but, proportionately, the standard reached was rather below that of recent years although there were about four times the number of Candidates this year. Answers should be more concise.

Gas Engineering (Supply)—Ordinary Grade.

The work submitted by Internal Students for the Ordinary Grade Certificate in Gas Engineering (Supply) was up to the average standard. The standard of the Question Papers varied considerably and it is suggested that in the interests of standardization throughout the country, a common Question Paper for the Ordinary Grade Examination should be introduced.

The questions were, on the whole, very well answered by the External Candidates who appeared to have covered the Syllabus very well and, with the exception of one or two instances kept well to the questions.

Certificate in Gas Supply.

The standard of the work submitted by Candidates for the Certificate in Gas Supply was, on the whole, disappointing. Some of the Candidates seemed to have no idea of subdividing or tabulating their answers. Questions dealing with practical applications were very poorly answered.

Gas Engineering (Supply)—Higher Grade.

The answers submitted by the Candidates for the Higher Grade Certificate in Gas Engineering (Supply) were rather disappointing, although a few were outstanding and showed that the Candidates had a good grip of the subject. There was a marked improvement in the conciseness of the answers, the questions dealing with lighting being the most unpopular.

Gas Engineering (Supply)—Diploma Grade.

There were only three entries for the Diploma Examination in Gas Engineering (Supply). Some of the answers submitted were ambiguous and rambling. No Candidate attempted the question on the gas engine.

Sketches.

The Board of Examiners desire to draw the attention of Teachers and Students in all grades to the need for, and value of, sketches in answering Examination Questions.

Unless otherwise stated, free-hand sketches only are required, but these should be neat, clearly lettered, and sufficiently large to show essential details in the construction and operation of the plant described. Students are recommended to practice sketching familiar pieces of plant in this manner.

Diagrammatic sketches will be considered satisfactory where such serve the purpose required.

Reference to lettering of sketches is recommended as a means of adding conciseness and clarity to the written description.

Minor Course Certificates in Gas Works Practice and Gas Supply Practice.

The Report of the Examiners of the City and Guilds of London Institute on the 1938 Examination for the Minor Course in Gas Supply Practice shows that there is an all-round improvement in the standard of the work and that the improvement in the quality of the sketching continues; but in both their written answers and in their sketches, Candidates still waste time by including unnecessary details.

No report has been issued on the Examination in Gas Works Practice in view of the fact that only four Candidates sat for it and it will not be offered in future years.

Gas Fitting Certificates.

The report of the Examiners of the City and Guilds of London Institute on the 1938 Examination in Gas Fitting shows that 2,074 Candidates were examined as compared with 2,141 in 1937. On the whole the standard of work was good but the Examiners recommend that in the first year of the Course more attention should be given to calculations, simple line sketching, and the conversion of cubic feet to B.Th.U's.

Topical Cricket Display at Burnley

An ingenious topical display supplied to the Burnley Gas Department by Messrs. John Wright & Co., Ltd. (Radiation Ltd.). The cut-out figures represent the members of the Lancashire County cricket team, together with Bradman and McCabe, of Australia. The progress of the second Test Match was "telegraphed" on the score-board at the back of the display, constantly engaging the attention of passers-by. The link with gas cooking is obvious from our picture.

Institution of Gas Engineers Examinations

The following questions were set for the Examinations in Gas Engineering and Gas Supply, which were held on April 30 and May 7, respectively.

GAS ENGINEERING.

ORDINARY GRADE.

2 p.m. to 5 p.m.

(Two questions only in each of the three Groups should be attempted.)

GROUP A.

1. Give the sequence of operations in the transport and preparation of coal from its arrival at the works to the retort. Describe one machine or appliance used in these operations.
2. How is the "draught" provided for a retort setting; how is it controlled and what physical considerations are involved? How can use be made of the surplus heat?
3. Describe how you would sample and analyze the waste gases from a retort setting. What composition would you expect under good working conditions?

GROUP B.

4. Give the approximate size of each section of plant and the storage required on a gas-works capable of making a maximum of one million cu.ft. per day. Indicate the simple rules you would use in arriving at your conclusions.
5. Describe any process for the recovery of crude benzole from coal gas. Express the calorific value of one gallon of crude benzole in therms.
6. Describe a method of working a set of four purifiers, showing diagrammatically the arrangement of valves and connexions you would suggest.

GROUP C.

7. Give a typical analysis and calorific value of (*a*) coal gas, (*b*) producer gas, (*c*) blue water gas. (*d*) Give a typical analysis of carburetted water gas of 450 B.Th.U. per cu.ft.
8. Describe briefly two different types of gasholders indicating the essential features of each.
9. How would you ascertain the quantity of water in a sample of crude coal tar?

HIGHER GRADE.

PART I., 2 p.m. to 5 p.m.

(Two questions only in each of the two groups should be attempted.)

GROUP A.

1. State, in their correct sequence, the operations to be carried out in heating a newly constructed bench of retorts of any one type from cold to working temperature.
   State the type of retort setting to which your answer applies.
   After how many days from the commencement should each operation named be carried out?
   What precautions should be taken to avoid risk of damage to the bench during heating up?
2. What type of plant would you recommend for the removal of coke from the retort house, and for its subsequent handling and preparation for sale in the case of *either*
   (*a*) A continuous vertical plant,
   or (*b*) An intermittent vertical chamber oven plant, carbonizing, say, 250 tons of coal per day?
3. Sketch and describe *either*
   (*a*) A scrubber standpipe gas offtake system, as employed on a setting of horizontal retorts,
   or (*b*) The coke extractor and operating mechanism of any one type of continuous vertical retort.

GROUP B.

4. By what considerations would you be guided in determining the size of relief holder to be provided in conjunction with a carburetted water gas plant of one million cu.ft. per 24 hours productive capacity?
   At what stage, relative to the remainder of the auxiliary plant of the water gas system, should the relief holder be placed?
   Criticize the practice, sometimes adopted, of connecting the relief holder to the water gas mains system by means of a single pipe, serving as a common inlet and outlet.
5. What information would you require in order to calculate the draught produced by a boiler chimney, and given this information, how would you proceed to make the calculation?
   Explain why a multi-tubular is preferred to a Lancashire or similar type of boiler for steam raising from "waste heat."
   What circumstances may lead to the accumulation of explosive gases in the flues of a Lancashire boiler setting?
6. Explain precisely what is meant by the following expressions, as commonly encountered in gas works practice:
   (*a*) Relative humidity.
   (*b*) Flash point.
   (*c*) Superheated steam.
   (*d*) Fixed carbon.
   (*e*) Net calorific value.
   (*f*) Absolute pressure.
   (*g*) Factor of safety.
   (*h*) Shatter test.

HIGHER GRADE.

PART II., 6 p.m. to 9 p.m.

(Two questions only in each of the two groups should be attempted.)

GROUP A.

1. Sketch and describe a suitable machine for cutting test pieces from the sheets of gasholders, as required by the Factories Act, 1937.
   How may the resulting holes in the sheeting be made good?
   What information would you expect to derive from the examination and testing of such test pieces?
2. Why is it the practice in many gas-works to admit a proportion of air into the crude gas stream?
   Explain what happens between the point of admission and the gasholder to the constituents of the air so admitted.
   State, giving your reasons, at what point in the system it is best to admit this air.
   How may the proportion of air admitted be controlled?
3. Discuss the relative merits and demerits of the various solvent oils commonly used for the extraction of benzole from coal gas.
   To what extent is the organic sulphur content of coal gas reduced by the practice of oil washing for benzole?
   What other processes may be employed to reduce the organic sulphur content of coal gas?

GROUP B.

4. Sketch a modern type of water-cooled condenser, showing the flow of gas, water, and condensates.
   Given two such condensers, show diagrammatically how you would arrange the gas valves and connexions to enable the condensers to be operated either in series or in parallel, or for one to be by-passed while the other continues to work.
   By what ready means would you ascertain whether a condenser of this type is working efficiently?
5. How would you make a complete analysis of town gas?
   Give typical analyses of gases of 500 B.Th.U. gross calorific value per cubic foot:
   (*a*) Made in horizontal retorts, with producer gas dilution, using a coal with which you are familiar, and which you should name.
   (*b*) Made in continuous vertical retorts, using the same coal.
   (*c*) Made in a carburetted water gas plant.
6. Distinguish between "positive" and "inferential" station meters.
   Mention some typical examples of each.
   What is the effect upon the accuracy and general behaviour of each of the meters you have mentioned of passing gas through it at a rate considerably in excess of that for which it was designed?

DIPLOMA EXAMINATION IN GAS ENGINEERING (Manufacture).

PART I., 2 p.m. to 5 p.m.

(Four questions only should be attempted.)

1. Give an outline specification with sketches for a modern carbonizing plant to provide one million cu.ft. of gas per day, selecting your own type and requirements, and including coal and coke handling plant, and all the plant for handling gaseous and liquid products inside the retort house.
2. There is a recent tendency to dispense, partly or wholly, with recuperation in the heating of carbonizing plants, in favour of steam generation by waste-heat boilers. Discuss this tendency in its economic aspects.
3. What are the most usual forms of deterioration of carbonizing plant refractories? State them in order of importance, giving their causes and effect. What steps can be taken to limit the deterioration?
4. Draw up a scheme, with the aid of sketches, of a purifier installation to deal with 2,500,000 cu.ft. of gas per day.
   Show diagrammatically valves and connexions.
   What are the factors determining:
   (*a*) Size of box.
   (*b*) Number and thickness of layers of oxide in each box.
   (*c*) Total volume of oxide.
   (*d*) Area of floor allotted to revivifying.
   (*e*) Oxide handling arrangements.
5. Discuss the relative merits of different types of gasholders in both economic and operative aspects.

PART II., 6 p.m. to 9 p.m.

(Four questions only should be attempted.)

1. How are the subsequent operations affected by the steaming of the charges in the carbonizing plant?
   What are the advantages to be derived from the electrical precipitation of tar, and is it an economical proposition?
   Give reasons for your answer.
2. By what means has the overall thermal efficiency of water gas production been progressively increased during recent years and by what amounts?
   Give heat balances showing the increases of thermal efficiency attained.
3. Give some account of recent work on two of the following:
   (*a*) The removal of sulphur compounds from town gas.
   (*b*) The purging by inert gas of gasholders, mains and plant.
   (*c*) Air Raid Precautions on gas-works.
   (*d*) The preparation of coke, particularly for the domestic market.
4. Describe, with the aid of sketches, the various types of foundations which are used for gas-works plant.
   Under what conditions would pressure piling be used instead of precast piling? If in charge of driving operations, how would you determine when a pile had reached its "set" and what would you consider to be a satisfactory set for a 12 in. square ferro-concrete pile 40 ft. long, which has to carry a load of 50 tons?
5. A works is to be equipped with horizontal retorts carbonizing 150 tons of coal per day, to which coal is to be delivered by truck alongside and from which coke is to be placed into hoppers above ground level. Having selected the type of electrically-driven coal and coke handling plant to be installed, calculate the size of motors required for each unit of plant and the size of generating plant you would adopt.
   Give your reasons for using A.C. or D.C. and state the precise type of motor you would employ for each unit of plant.

GAS SUPPLY.

ORDINARY GRADE.

2 p.m. to 5 p.m.

(Two questions only in each of the three groups should be attempted.)

GROUP A.

1. (*a*) What materials are used for:
   (i) Pipes for mains,
   (ii) Service pipes?
   (*b*) Describe briefly with rough sketches four types of joints for gas mains. State for what type of main these are suitable and give their relative advantages and disadvantages.
2. Explain how you would locate an escape of gas from a main laid beneath a concrete roadway. Describe the apparatus required and methods you would use in order to detect it.
3. Give the constituents of an average town gas, and state the percentage of each you would expect to find in a typical sample. Calculate the volume of water vapour produced by combustion of 1 cu.ft. of this gas.

GROUP B.

4. (*a*) Make a line sketch showing the vertical cross-section through the upper part of a house with an instantaneous type of gas water heater on the top floor ventilated to the outside air.
   (*b*) Letter each component part of the ventilating equipment, and make a list showing against each part:
   (i) Name,
   (ii) Material of which it is composed,
   (iii) Purpose.
5. Describe one form of gas oven safety tap.
   Explain the meanings of "half niting" and "quarter niting," and state the advantages of washer niting over pin niting. Sketch one form of washer niting.
6. Is the heat obtainable from a Bunsen flame the same as, less than or greater than, the heat obtainable from a non-aerated flame burning the same number of cubic feet of gas per hour?
   Why are non-aerated gas burners preferred to Bunsen burners for water-heating appliances?

GROUP C.

7. Indicate briefly how the heat produced in (*a*) a gas fire and (*b*) a gas radiator is imparted to a room, stating in each case the approximate percentages of radiant heat and convected heat.
   What use is made of the remaining heat, if any?
8. Sketch a section of a register for recording pressure at the inlet of a consumer's meter during a period of 24 hours. State how it functions.
9. Sketch a simple form of gas-heated stove used for industrial drying operations.
   Describe the operation of the burner system adopted.
   What measures are taken to ensure the safety of the stove when working?

OR

Describe the operation of the following:
(i) A non-return valve,
(ii) An anti-suction (meter-protection) valve,
(iii) A pressure-stat,
(iv) A bi-metal cut-out device.

HIGHER GRADE.

PART I., 2 p.m. to 5 p.m.

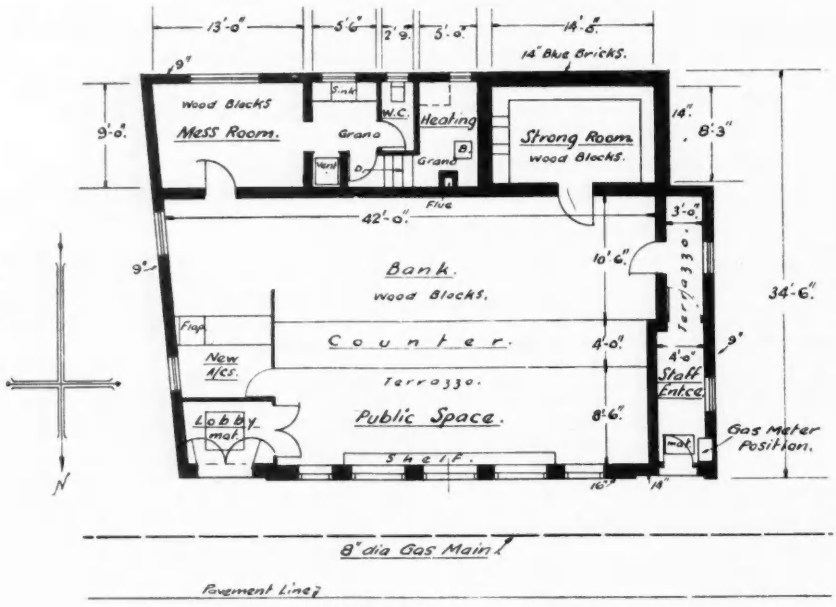
(Two questions only in Group A and three questions only in Group B should be attempted.)

GROUP A.

1. The attached plan is of a small Branch Bank which is to be heated from a gas-fired boiler. On the plan mark gas and water pipes and positions of meter, boiler, and radiators.
2. Discuss the relative merits of bottom flue and top flue outlets for gas ovens and state the respective merits claimed for (*a*) one burner and (*b*) two burners for heating the oven.
   Sketch the probable circulation of the heated air in the two types of oven.
3. A complaint is received that a domestic refrigerator, having worked satisfactorily for six months, suddenly stopped.
   Describe what steps you would take in investigating this complaint.

GROUP B.

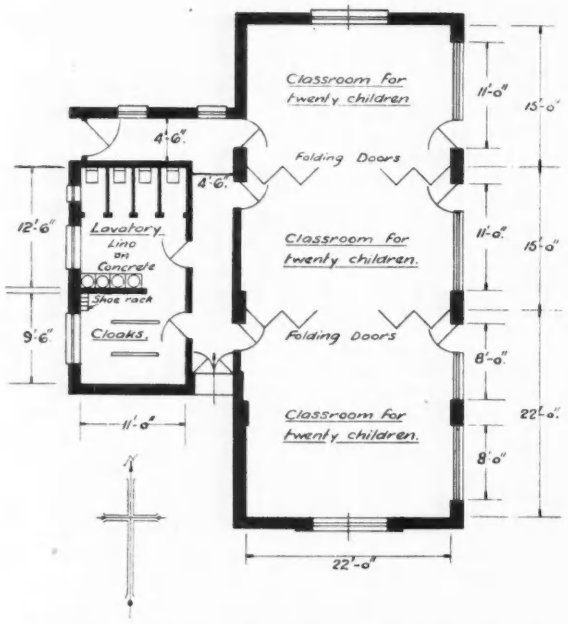
4. Under what conditions would you use:
   (*a*) A pressure operated cut-off,
   (*b*) A bi-metal cut-out device.
   Sketch and describe one form of each.
   Give specification for one of these.
5. (*a*) Describe the construction and operation of a constant pressure governor of the spring loaded single valve diaphragm type.
   (*b*) If the gas pressure to a house has to be controlled by a service governor, would you fix it on the meter inlet or outlet? Give reasons for your answer.



Higher Grade Examination in Gas Engineering (Supply)—Part I, Question 1.

Ground floor plan: Height from floor to ceiling, 12 ft. Flat roof over.

6. On the attached plan of a school mark the run and sizes of gas pipes for lighting only. Mark the position of the lighting points and specify the type of fittings you would recommend to give a minimum of 5 foot-candles at desk level.



Higher Grade Examination in Gas Engineering (Supply)—Part Question 6.

Kindergarten block ground floor plan—Height from floor to ceiling, 14 ft. Flat roof over.

7. A consumer requires a furnace for aluminium melting.
   (*a*) State what you know of the process.
   (*b*) Sketch and describe the type of furnace you would recommend.
   (*c*) Give the hourly gas rate for the selected size of furnace.

OR

Describe the application of gas to one of the following processes:
   (i) Varnish making.
   (ii) Vitreous enamelling.
   (iii) Pottery firing.

Sketch and describe a gas furnace or industrial appliance used in that process.

Higher Grade.

Part II., 6 p.m. to 9 p.m.

(Two questions only in Group A and three questions only in Group B should be attempted.)

Group A.

1. (*a*) State the meanings of the symbols and the units of measurement of each of the following formula for flow of gas in pipes:

$$Q = 2.675 \sqrt{\frac{d^5}{SL} \cdot \frac{P1^2 - P2^2}{Pa^2}}$$

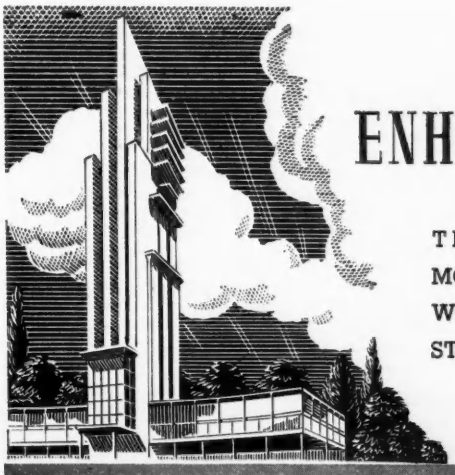
   (*b*) If gas flows through a pipe of 6 in. internal diameter at a velocity of 10 ft. per second, what is the rate of flow in cu.ft. per hour?

2. "High capacity" meters are being extensively used.
   State fully how they differ from and their advantages over the ordinary type of dry meter.

3. How many British Thermal Units are required for one candle hour:
   (*a*) With a low pressure inverted incandescent gas mantle—
      (i) Without pre-heater,
      (ii) With pre-heater,
   (*b*) With a high pressure inverted incandescent mantle?
   What is the average consumption of electricity for a "half-watt" gas-filled lamp for one candle hour?
   Calculate the cost of a Board of Trade Unit to give light equivalent to that obtained from a low pressure inverted incandescent gas mantle without pre-heater, the price of gas being 9d. per therm.

Group B.

4. (*a*) State briefly the merits and demerits, if any, of each of the following methods of providing automatic ignition of gas appliances:
      (i) Flame pilot,
      (ii) Electrically heated filament,



ENHANCING THE PRESTIGE OF GAS FOR COOKING

THE RENOWN IN THE MODERN KITCHEN ON THE WOMEN'S GAS COUNCIL STAND, EMPIRE EXHIBITION, GLASGOW.

The PARKINSON RENOWN GAS ★ COOKER

It is related that there was, in ancient times, a young man who had married the daughter of a renowned worker in metals and who aspired to surpass his father-in-law in his Craft. So he journeyed to distant lands, and at length he found the true Philosopher's Stone with which he produced much gold and made objects therefrom.

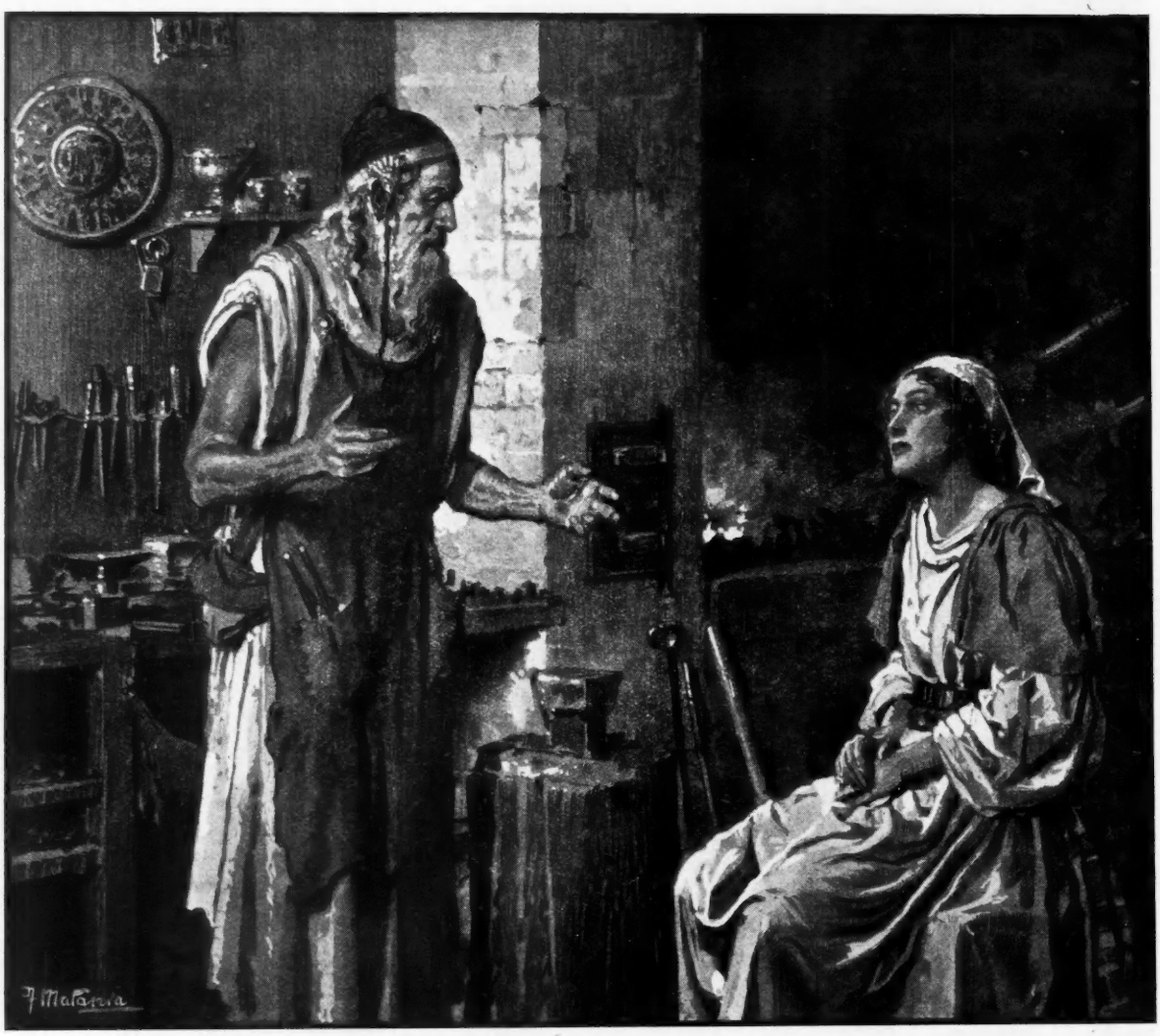
But, alas! he could sell them for little more than the value of the gold, whereas the older man, though he had to buy his gold, made objects of a perfection almost beyond price.

Sorely troubled by this, the young wife visited her father secretly to ask the wherefore.

"Ah, my daughter," her father exclaimed, "tell your husband that he has forgotten the one thing more precious than gold."

"And what is that?" asked the girl.

"It is Craftsmanship, my daughter, which cannot be lost, stolen or transmuted, and whose value cannot be weighed in the mightiest scale in the world."



As modern as to-morrow, but with the knowledge and experience of 144 years, Newton Chambers & Co., Ltd., specialise in the manufacture of Blast Furnace Plant, Gas Works Plant, Steel Works Plant, General Chemical Plant, Benzole Plant, By-Product Plant, Cast Iron Tanks, Steel Tanks, Coke Oven Machinery, Pig Iron, Excavators, Economisers, Air Heaters, Recuperators, General Castings for the various trades and all forms of Light Castings.

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(iii) Cold catalyst.
(iv) Flint and striker.

(*b*) Give brief details of the manner in which these methods may be employed to:

(i) Light the burners of a cooker,
(ii) Provide automatic ignition of hotplate burners only,
(iii) Ignite the gas burner of a coal grate.

5. Explain in simple terms the origin of the light from:
(*a*) A self-luminous flame,
(*b*) An incandescent gas mantle,
(*c*) A metal-filament electric lamp.
What conditions are to be observed, if the maximum amount of light is to be obtained from a flat-flame burner and from an "Argand" burner?

6. You are required to examine an instantaneous water heater to determine whether the design and performance are suitable for approval. Indicate the tests you would make, the performance you would regard as the minimum acceptable, and the practical details affecting maintenance upon which you would insist.

7. State briefly the relative merits and demerits of gas, solid fuel, fuel oil and electricity for central heating and hot water supply, say, in a block of service flats or other building with which you may be familiar.
State the factors affecting the respective operating costs.

DIPLOMA EXAMINATION IN GAS ENGINEERING (Supply).

PART I., 2 p.m. to 5 p.m.

(*Three questions only should be attempted.*)

1. (*a*) What is meant by the following terms as applied to the flow of gas in pipes?
(i) Streamline flow,
(ii) Turbulent flow,
(iii) Co-efficient of friction,
(iv) Reynolds Criterion.
Your answer should be illustrated by a diagram showing approximately the relation between these terms.
(*b*) What assumption is made in deriving Pole's formula:

$$Q = 1{,}350 \sqrt{\frac{hd^5}{SL}}$$

from the low pressure formula:

$$Q = 188 \sqrt{\frac{hd^5}{\zeta SL}}.$$

2. Describe with sketches recent developments in (*a*) high pressure and (*b*) low pressure high-power, incandescent gas lamps.
Discuss the relative merits of high pressure and low pressure gas lamps for street lighting.

3. Explain the phenomena and mechanism of the combustion of gas in (*a*) a self-luminous flame and (*b*) a Bunsen flame.
Define calorific intensity and calorific value. Is there any definite relationship between these?
Calculate the calorific intensity of a gas of the following volumetric analysis:
$CO_2 - 1{\cdot}6\%$; $O_2 - 0{\cdot}2\%$; $CO - 6{\cdot}8\%$; $C_6H_6 - 3{\cdot}4\%$; $H_2 - 53{\cdot}6\%$; $CH_4 - 27{\cdot}9\%$; $N_2 - 6{\cdot}5\%$.
Assuming the mean specific heat of N_2 is 0·26, of CO_2 is 0·28, and of H_2O vapour is 0·58, why is the calculated figure not realized in practice?

4. Make a comparison between a 50 B.H.P. gas engine and a 50 B.H.P. Diesel oil engine for generating electricity for lighting and power load. Price of gas—6d. per therm.

5. Describe a system of burning gas by which temperatures of the order of 1800° C. can be attained in a furnace.
Explain the difference between regeneration and recuperation and describe one well-known system of regeneration applied to gas furnaces.

PART II., 6 p.m. to 9 p.m.

(*Three questions only should be attempted.*)

1. (*a*) It is necessary to lay a new 18 in. diameter gas main beneath an electrified railway. There are two railway tracks, and the electricity is conveyed through two conductor rails—one to each track.
Explain how you would lay and joint the main, and describe with the aid of a sketch the steps you would take to safeguard the pipeline from possible damage by electricity leaking from the railway system.
(*b*) It is suspected that a gas main running alongside an electrified railway is affected by stray electric currents. There is a service pipe to a meter supplying gas to a signal box.
What tests would you make to confirm the suspicion of electrolysis, and state the steps you would take to overcome the trouble?

2. (*a*) Give the headings of clauses for a Specification for laying 10 miles of 12 in. main with lead joints through an urban district.
(*b*) In the above Specification give in detail clauses for:
(i) Excavating and filling in the trench,
(ii) Jointing the pipes.

3. Make a diagrammatic sketch of a type of solid fuel-fired boiler or oil-fired boiler suitable for conversion to gas firing. Give a complete description of how to effect such a conversion, together with the necessary controls, stating the efficiency to be expected and give a full analysis of the flue gases at maximum gas rate.

4. (*a*) A flueless radiator consuming 10 cu.ft. per hour of 500 B.Th.U. gas is installed in a room of 1000 cu.ft. capacity. The CO/CO_2 ratio for this appliance is 0·005, the CO_2 produced is 0·48 cu.ft., the air change through the room is 2 per hour, the sulphur content of the gas is 20 gr. per 100 cu.ft. The radiator is in continuous use. Assuming intimate mixing and the sulphur to be present in the form of SO_2, and that 50% of the SO_2 is absorbed by the walls, calculate the maximum possible percentage of CO_2, CO, and SO_2 in this room.
(*b*) As a result of your calculations state whether you consider this to be a suitable appliance to use under these conditions and give reasons for your deductions. You should comment on both the hygienic and comfort conditions likely to result from the use of this appliance.

5. Describe a town gas-fired furnace for some industrial process with which you are familiar (not central heating). Give details of construction, cycle of operation, gas consumption and the efficiency of furnace expected, when applied to the process selected.

Amalgamation and Grouping

Gas Consolidation and Churnet Valley.

Gas Consolidation, Ltd., has made two alternative offers for the whole or part of the issued share capital of the Churnet Valley Gas Company. For every 100 £1 Ordinary shares of the Churnet Company either (1) £60 in cash, or (2) 60 fully paid £1 "A" Ordinary shares of Gas Consolidation, or proportionately for a smaller number of shares. The shares offered will rank for dividend from June 1 last. The offer is conditional on its acceptance by July 25, and will be completed on Aug. 10.

North British Association

The Annual General Meeting of the North British Association of Gas Managers will be held in the Picture House, Waterside Street, Largs, on Thursday, Sept. 8 next, under the Presidency of Mr. George Braidwood, of Coatbridge.

The Annual Excursion will take place on the following day and will take the form of a cruise "Round the Lochs" on T.S. "Duchess of Montrose." The Chairman and Directors of the Coatbridge Gas Company will accord a reception to the members and their ladies on the Thursday evening. During the afternoon a drive is being arranged for the ladies by invitation of the Largs Town Council.

The usual sporting events will be held on the Wednesday, including golf competitions, bowling, and putting.

Gas-Propelled 'Buses for Cardiff?

During discussion at a meeting of the Cardiff Transport Committee on July 14 on the proposed substitution of the existing tramway system at Cardiff by either oil or trolley 'buses, the Lord Mayor (Alderman O. Cuthbert Purnell), who had previously suggested the use of gas-propelled vehicles to replace tramcars, again broached the subject with a view to securing reports on experiments with two such 'buses.

The Committee agreed that the Transport Manager (Mr. William Forbes) should prepare a comprehensive report on the system, and he was empowered to have two 'buses fitted for gas consumption for purposes of comparison. The Lord Mayor said that the Coal Utilisation Council was anxious for the experiment to be made by the Cardiff Corporation. There had been experiments by two towns in Great Britain. Without any reference to the Transport Committee he had gone into the figures, which indicated that if the Cardiff Corporation transport service could be operated by gas instead of oil fuel 150,000 tons of coal annually could be used. This was so important that there should be an endeavour to make this market available to the collieries.

Alderman Henry Johns (Chairman) said that as far as he could see gas would give as great mobility as oil or petrol, and the Lord Mayor said that according to his information it would be cheaper to run 'buses on gas.

Gas Undertakings' Results

Alyth.

At the annual meeting of shareholders of Alyth (Perthshire) Gas Light Company, Ltd., on July 11, Mr. Ritchie Smith, Chairman, presiding, a dividend of 5%, less tax, was declared.

Birmingham.

The audited statement of accounts of the City of Birmingham Gas Department for the twelve months to March last shows that the total capital raised is £5,957,569. Of this sum, £2,843,440 has been redeemed and £122,947 has been repaid (being in excess of capital requirements), leaving an outstanding liability of £2,991,182, as against £3,025,025 twelve months ago. The net amount received in the past year from the sale of gas totalled £1,979,010, which is an increase of £32,961 when compared with the preceding twelve months. For the fourth year in succession the quantity of gas sold during the twelve months was a record in the history of the undertaking. The total sales amounted to 16,126,073,800 cu.ft., which represents an increase for the year of 334,466,400 cu.ft., or 2·12%. Having regard to the very mild weather conditions which prevailed during the latter part of the financial year, the Committee consider that this result is satisfactory. The total credits on Revenue Account are up £117,682, at £2,675,599. The balance transferred to Net Revenue Account is £444,536, as compared with £373,065 a year ago, and after providing for interest and other charges, the sum of £93,747 remains to be transferred to the Appropriation Account, as against £21,789 in last year's accounts. The greater part of this sum is transferred to Renewals and Special Expenditure Account.

Brechin.

In the annual report of Brechin Gas Company, Ltd., it is shown that after providing for depreciation, meeting dividends on preference shares, and adding to renewal funds and reserve fund for taxes, there remains at the credit of the profit and loss account a balance of £2,570. Payment of a dividend on the ordinary shares at the rate of 2s. 6d. per share, and a bonus of 9d. per share, both less income-tax, is recommended by the Directors. This will absorb £2,121, leaving a balance of £449 to be carried forward, subject to Directors' remuneration.

Dunfermline.

The Dunfermline Gas Department report shows that for the year ended May 15, 1938, after contributing to sinking fund and other charges, including £750 to retort repair reserve fund, there was a debit balance of £1,114, against an estimated surplus of £278. The sum of £1,853 was carried forward from the previous year, leaving therefore £739 available to be carried forward. During last year £3,187 had been taken from revenue for repair and renewal of pipes, against £1,800 allowed for this purpose in last year's estimates. The renewals of mains through street reconstruction and the uplifting of tramway rails accounted for the increase. Draft estimates for 1938-39 show expenditure of £74,720 and income of £74,098, an apparent deficit of £622, which, when deducted from the balance of £739 mentioned, will leave an estimated surplus of £117. The price of gas is to remain unchanged.

Edinburgh.

The annual report of the Edinburgh Corporation Gas Department shows a gross profit of £134,753, and a net surplus of £12,984 after meeting interest and sinking fund charges of £94,194 and income-tax £27,575. Special expenditure met from revenue account was: New service pipes £17,800, special contribution towards depreciation of cookers and meters £8,500, special grant to superannuation fund £7,000, grant for modernizing street lighting £1,500, and contribution towards cost of new Municipal Publicity Department £2,000, making a total of £36,800. The average price of gas was 2s. 5·23d. per 1,000 cu.ft. (6·15d. per therm)—a new low record. Gas sales on the other hand constituted a new high record at 3,948 million cu.ft., an increase of just over 2¼% on the previous year. Notwithstanding the increased cost of coal and other raw materials it is hoped that no increase in the price will be necessary. Appliances fitted on the district numbered over 10,000 cookers, 3,000 other cooking appliances, 3,500 heating appliances, 700 water heaters, and over 100 refrigerators.

Hamilton.

At a meeting of the Hamilton Town Council it was reported by Bailie Kay that the Corporation Gas Undertaking showed a net profit of £2,906, while the reserve fund now stood at £10,705. The average cost of gas for domestic use is to be reduced from 2s. 8½d. to 2s. 6d. per 1,000 cu.ft.

Kirkcaldy.

The Kirkcaldy Gas Department reports net profit for the year, after appropriating £500 to reserve, of £278. The net installation costs of stoves, &c., have been written against profits, this costing £1,146. The resulting closing deficit of £868 will be met from reserve. The figure of £1,146 is higher than usual, showing the recent expansion in the sale and hire-purchase of gas appliances. Revenue from gas sales was £41,649, an increase of £1,100 over the previous year. The reserve fund balance is now £18,560, while the capital debt outstanding is £133,016, this having been increased last year by £8,466 due to expenditure on a new gasholder and other items.

Leven.

The Buckhaven and Leven Gas Commissioners have approved of a recommendation by Mr. H. A. Aitken, General Manager, to reduce the price of gas by 2d. per 1,000 cu.ft., and this to take effect from the quarter ending August 15. The Manager's report stated that the estimates prepared of the proportion of income and expenditure for the ensuing financial year, showed a surplus of £867 on the basis of output of gas during the past year being maintained. The report showed that there was a profit of £565 during the past year. The price of gas has fallen from 7s. 1d. per 1,000 cu.ft. in 1922 to 3s. 5d. in 1938, and the sale of gas in the same period has risen from 81,128,000 cu.ft. to 165,137,800 cu.ft.

Lincoln.

The industrial load has been mainly responsible for a highly gratifying increase in gas output at Lincoln during the twelve months to March 31 last. The gas production for the year was 791,036,000 cu.ft., which represents an increase over the previous year of approximately 8½%, or more than 50% increase since 1932. It is also a pleasing feature that domestic consumers still show a steady expansion. It is calculated that the carbonizing plant will be working to full capacity next winter, while the question of gasholder accommodation will have to be faced in the near future. The number of ordinary consumers has been increased during the year by 229, bringing the total up to 19,450. An almost similar increase brought the total of prepayment meters in use to 13,555. There are 15,171 cookers in service. The Revenue Account shows the sales of gas to have been divided up as follows: Private consumers, 240,265,100 cu.ft.; prepayment meters, 235,099,440 cu.ft.; industrial consumers, 220,746,000 cu.ft.; and public lighting, 34,553,200 cu.ft. This makes the total amount of gas sold 730,663,740 cu.ft. The net profit of £5,750 has been transferred to the Net Revenue Appropriation Account, the balance on which, after spending £4,000 on additional plant during the year, now amounts to £31,522. The amounts due under hire-purchase agreements totalled at March 31 £41,100. At the same date the outstanding debt of the undertaking was £169,257, as against which the capital value was £462,903.

Lochgelly.

At the 53rd annual meeting, presided over by Bailie A. Westwater, the annual report submitted showed a net profit for the year of £848; a dividend of 3½%, less tax, was declared.

Macclesfield.

The Macclesfield Gas Committee which reports a net profit on the Gas Undertaking for the year of £1,514 (as against £2,878 for the previous year) has resolved that the present scale of charges be continued for the year ending March 31, 1939, and that the rebate from the charges for gas supplied to consumers remain at 12½% for the two winter quarters, and be reduced from 50% to 33⅓% after the June reading of the meters, for the remaining summer quarter of the current financial year. This rebate will be allowed only in the case of payment of the account in full by the time stated on the demand note—namely, within three weeks from the despatch of such demand note by the Borough Treasurer's Department.

Stratford-upon-Avon.

An increase of 4·3% in gas sales is reported from Stratford-upon-Avon, some of which has been due to the extended use of modern domestic appliances. The gas sold and accounted for in the year to March, 1938, totalled 167,112,700 cu.ft., as compared with 160,135,600 cu.ft. in the previous twelve months—increase 6,977,100 cu.ft. As the gas manufactured was increased by only 5,965,000 cu.ft., the unaccounted-for shows a reduction from 5·3% to 4·5%. The vertical retort installation has been in operation for two complete years, and the conversion of the old horizontal retort house into stores and offices has been accomplished. The net profit is £1,636, and the general rate fund contribution, at £750, is the same as in the previous year.

Cefn and District Gas Order

A matter which may prove of considerable importance to the Gas Industry was raised by the Great Western Railway Company in connexion with the Special Order of the Cefn Mawr and Rhosymedre Gas Company, Ltd., which was the subject of enquiry at the Board of Trade Offices, Westminster, on Friday, July 8, by Mr. R. L. Sich. The Order was promoted as the result of the provisions of section 9 of the Gas Undertakings Act, 1934, whereby the Board of Trade may give notice to non-statutory companies supplying more than 30 million cu.ft. of gas per annum to promote an Order to secure statutory powers. Such a notice was made by the Board in this case.

The particular point at issue in regard to the Railway Company was that it asked for power to recover from the Gas Company the extra costs incurred, when widening or reconstructing a bridge, by reason of the presence of a gas main on that bridge. The Gas Company resisted the demand for such protection, and there is a possibility of the matter being submitted to Parliament.

The Cefn Mawr Gas Company supplies gas in the parish of Cefn Mawr and an area around it (in the rural district of Wrexham) in North Wales, and it proposes to add to its limits an area including the village of Chirk (in the rural district of Festiniog). There are also provisions for increased capital and for a differential charge in the outer area.

Mr. ARTHUR J. LEES (of Messrs. Lees & Co., Parliamentary Agents), for the Company, said it was registered in 1866, with a capital of £2,000, and there were subsequent increases to £12,000 in 1925, of which £10,000 was paid up. In 1936 the capital was raised to £15,000 by the capitalizing of the reserve fund of £3,000. At the end of that year, Mr. George Evetts (Consulting Engineer, Westminster) had valued the structure of the undertaking (without goodwill) at £24,366. As a result, the capital was increased to £28,000 by the creation of 13,000 shares of £1, representing the additional value of the assets—*i.e.*, the capital was written up. The present authorized capital, therefore, was £28,000, of which £26,000 was fully paid up. The Order asked for capital powers of £30,000, *plus* borrowing powers to the extent of half the paid-up share capital.

In 1937 the Company sold 32 million cu.ft. of gas, and the capital expenditure represented £713 per million. For some years prior to 1937 the sales had varied between 33 and 34 millions, and the sales for 1938 were expected to show an increase over 1937; up to the end of May the increase was nearly 4%. Of the total sales, approximately 13% was sold to ordinary consumers, 55% to prepayment consumers, 8% for public lighting, and 24% for industrial use. The prices to ordinary consumers were 4s. 9d. per 1,000 cu.ft. for lighting only, 4s. 3d. for lighting, cooking, and heating, 3s. 11d. to special customers, 5s. 10d. to prepayment consumers for lighting only, 5s. for lighting and cooking. The prices to industrial consumers varied from 3s. 5d. to 3s. 11d., except to one special consumer who paid an average price of 2s. 11d. The calculated calorific value of the gas was 411 B.Th.U. per cu.ft., so that the Company would have no difficulty in declaring 400 B.Th.U.

The dividend asked for on the whole of the capital was 7%.

It was proposed that the maximum price to apply to the inner area (within a radius of 1½ miles of the gas-works) should be 5s. 6d. per 1,000 cu.ft. until the declaration of calorific value, and the equivalent of 16d. per therm thereafter; and the differential asked for in respect of the outer area was 10d. per 1,000 cu.ft., or the equivalent of 2½d. per therm. The margin between the present top price of 4s. 9d. per 1,000 cu.ft. to ordinary consumers and the maximum price for the inner area was thus 9d. The differential charge was not compulsory.

Railway Company's Opposition.

Dealing with the opposition of the Great Western Railway Company, Mr. Lees said it was stated that there were 14 public roads passing over the railway in the area covered by the Order, 8 public roads passing under the railway, and 4 crossing on the level. It was argued that the protection given by the Gas-Works (Clauses) Act was inadequate, and the Railway Company had asked for a protective clause to include a provision that any additional expense incurred by reason of the presence of the gas mains in the road when reconstructing, widening, or altering a bridge should be borne by the Gas Company. The Cefn Mawr Company was willing to concede a protective clause to the Railway Company, but not with that special provision.

The Railway Company had cited the Eastbourne Company's Act of 1909 as a precedent. On the other hand, Mr. Lees pointed out that in connexion with the Rochester, Chatham, and Gillingham Gas Company's Special Order of 1930 (reported in the "JOURNAL" for June 18, 1930, p. 834) the Southern Railway Company had asked for a clause similar to that now submitted by the Great Western Railway Company, but the Board of Trade had decided against the Southern Railway Company and no clause for the protection of the Railway Company was inserted in that Order. In the Eastbourne case, in 1909, the London, Brighton, and South Coast Railway Company had asked for a protective clause, which was resisted *in toto* by the Gas Company, and no particular attention was given to the paragraph dealing with the recovery of extra costs from the Gas Company. He gave a list of Acts and Orders from 1909 onwards showing cases in which clauses were inserted for the protection of railway companies, but which did not contain the particular provision to which he objected. So far as he was aware, the matter had not been before a Parliamentary Committee since 1909; but admittedly clauses had been inserted in cases where gas companies had agreed in order to avoid a fight.

The clause which the Cefn Mawr Company was willing to concede was one which was inserted by agreement with the L.M.S.R. and L.N.E.R. in the West Yorkshire Gas Distribution Bill, which was now before Parliament and had passed through the House of Lords. The West Yorkshire Bill covered a very much larger area than that of the Cefn Mawr Company, and the pipes, which were to carry coke oven gas, would be very much larger; yet the L.M.S.R. and the L.N.E.R., which were the two largest railway undertakings in the country, were satisfied, and that was fairly good evidence that they did not consider the special provision (such as now asked for by the G.W.R.) was reasonable, or that they did not think they would get it if they pressed for it. To concede such a provision might mean a considerable burden to the Gas Industry, for a railway company could reconstruct a bridge at any time it liked. How could it be said that the mere existence of a 4-in., 6-in., or 8-in. gas pipe in the road over a railway bridge would add materially to the expense of reconstruction? To say that a gas or water undertaker, or any other concern using mains in the road over a bridge, must pay to the railway company concerned the extra cost incurred in reconstruction of the bridge due to the presence of those mains was most unreasonable, and the attitude of the railway companies other than the G.W.R. seemed to confirm that view.

Reasonable Capital Expenditure.

Mr. *George Evetts*, giving evidence, said that the capital expenditure of £713 per million cu.ft. by the Cefn Mawr Company was reasonable for an undertaking of its size supplying in a country district. In 1937 there was a reduction of profits, in view of the increased costs of wages and materials; the Company was one of the few which had kept the price of gas consistent during the past five years in spite of increased costs. He believed the margin of 9d. per 1,000 cu.ft. between the actual price and the maximum price asked for in the Order was lower than the Board of Trade would have granted if the Company had asked for more. He estimated that in the village of Chirk, in the added area, there would be 500 consumers, mostly prepayment consumers. The Company would never be able to supply gas in Chirk at the same price as in Cefn Mawr, unless the consumers in Cefn Mawr were to subsidize the consumers in the outer area. If the differential were reduced below 2½d. per therm, the Company did not want the added area.

Mr. LEES commented that there was no opposition by the Festiniog R.D.C., in whose area Chirk was situated.

Mr. *Evetts*, referring to the G.W.R. Company, said that the clause offered by the Cefn Mawr Gas Company, combined with the provisions of the Gas Works (Clauses) Act, gave the Railway Company all the protection it needed.

Mr. J. J. MACINTYRE (for the Wrexham R.D.C.) pointed out that the charges for gas for lighting by the Wrexham Gas Company were from 9d. to 11·4d. per therm, according to distance from the centre of the area, and gas was supplied for industrial uses at 6·8d., 8d., and 9·2d. per therm. He asked if it would not be advisable from the Cefn Mawr Company's point of view to reduce maximum prices in order to encourage the sale of gas within its inner area.

Mr. *Evetts* said he did not think that anything the Board of Trade might do by way of compulsion would result in the consumers getting cheaper gas.

Cross-examined by Mr. COPE MORGAN, on behalf of the G.W.R., Mr. Evetts said there were at present four agreements with the Railway Company affecting four bridges, which gave the protection now asked for, and he did not think it would be a fair thing to go back on those agreements, which, he agreed, had never caused the Gas Company any expense. Generally speaking, he agreed that where the presence of the gas mains on a bridge caused expense to the Railway Company, then the Gas Company should pay that expense, but he contended that the

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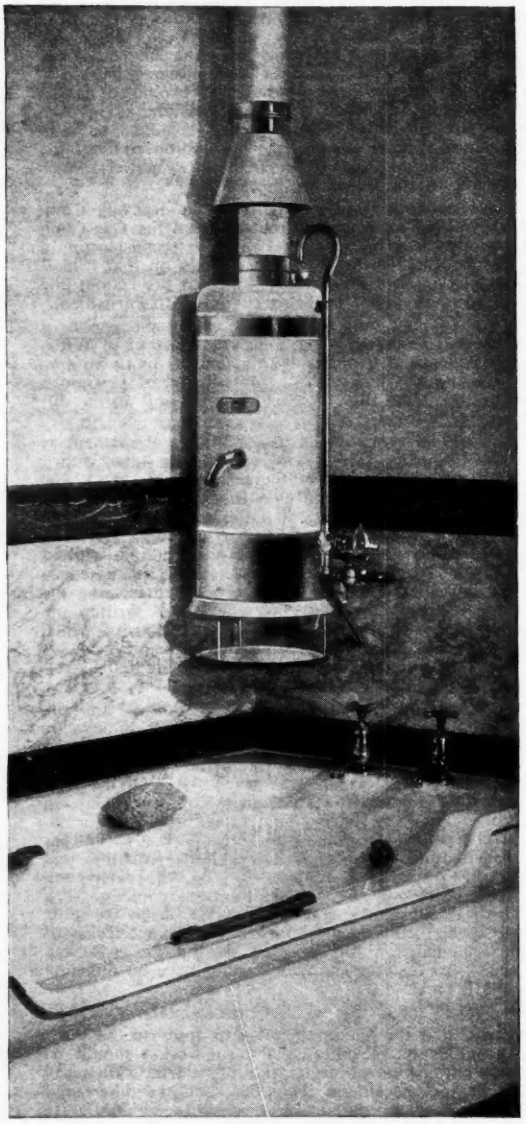

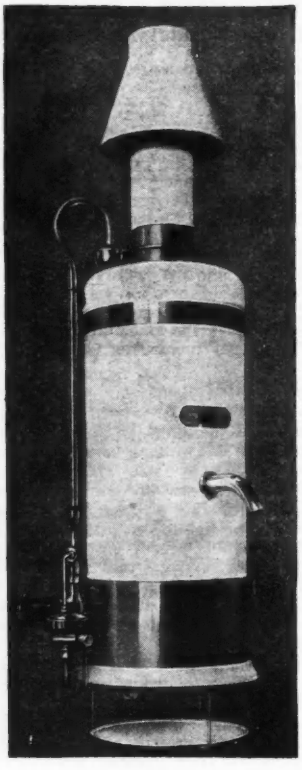

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reconstruction of a bridge for the purposes of the Railway was not due to the presence of the gas mains.

This completed the promoter's case.

Cost of Mains on Bridges.

Mr. *A. S. Quartermain* (Deputy Chief Engineer to the G.W.R.), giving evidence on behalf of that Company, said that some of the bridges in this area had a span of from 15 to 30 ft., and in such cases the cost of alteration of the gas mains due to a reconstruction of the bridge would be a matter of from £10 to £30. In the case of the bigger bridges, which had a span up to 90 ft., the cost might be £100 or a little more, and he insisted that that expense was due solely to the presence of the gas mains and would not otherwise have to be incurred. The object of this protection was to provide for the future when the cost might or might not arise. He believed that not a penny had so far been incurred by the Gas Company in this connexion, although the existing agreements to pay had been in existence for many years.

Mr. COPE MORGAN, addressing the Inspector on behalf of the Railway Company, said there was an impression that it was the definite policy of the Board of Trade not to grant this clause and should it not be granted in this case he asked that the reasons should be given, so that the Railway Companies might know where they were, as in that event the matter would have to go farther. The Gas Company in this case, in respect of certain bridges, had entered into agreements giving the protection asked for, but now that they were seeking statutory powers the Gas Company was asking for rights, and it was necessary to define the conditions on which those rights should be given.

Mr. MACINTYRE, speaking on behalf of the Wrexham Rural District Council, said that body had a duty to perform in seeing that the consumers of gas were treated fairly when the Company came to the Board of Trade for statutory powers. Referring to the price, he urged that the present price to ordinary consumers of 4s. 9d. per 1,000 cu.ft. was too high for lighting, and pointed out that there was one instance in which gas was supplied to a large consumer for 2s. 11d. per 1,000 cu.ft. He suggested that the difference between 2s. 11d. and 4s. 9d. was too great and the charge for lighting of 4s. 9d. should be reduced. Then the Company was asking for a maximum price of 5s. 6d., which, in the view of the Wrexham Rural District Council, should be reduced to the present charge of 4s. 9d., which was the equivalent of 14·2d. per therm. He added that the Rural District Council was contemplating building 200 to 300 Council houses in this area, and that he would have thought it would be to the advantage of the Gas Company to make the price of gas attractive in order to secure the tenants of these houses as consumers.

It was further asked that the Rural District Council should, in the Order, be constituted the "local authority" for the purposes of the 1920 Act, instead of the County Council, for the reason that the Rural District Council had a very close interest in this particular area, whereas the County Council could have no interest at all.

Mr. *Evetts* remarked that Mr. MacIntyre need feel no grievance that gas was being supplied at 2s. 11d. per 1,000 cu.ft. to one consumer, because that price was available to anybody who took 8,000,000 cu.ft. per annum.

The enquiry then closed and the Inspector will report to the Board of Trade in the usual way.

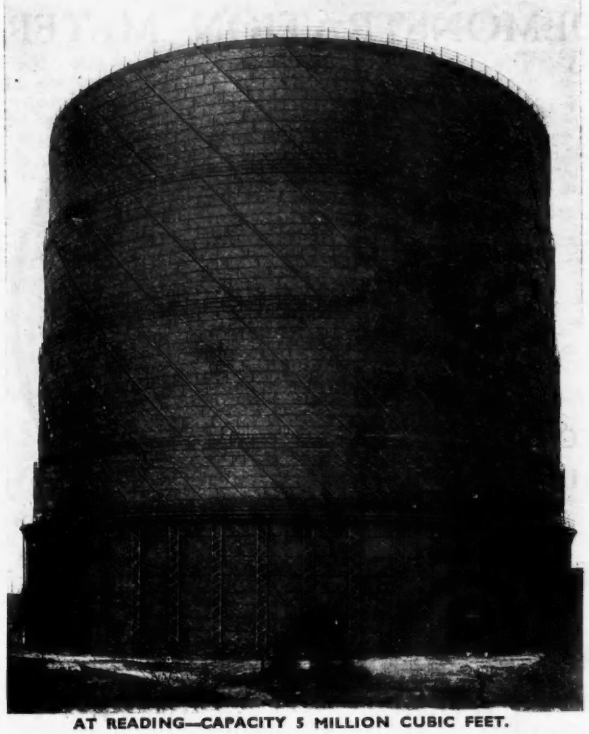
Manchester and District Juniors

Visit to Newton Chambers & Co., Ltd.

The final meeting of the Manchester and District Junior Gas Association was held on Wednesday, June 15, when the Directors of Messrs. Newton Chambers & Co., Ltd., invited the members and their ladies to visit the Thorncliffe Works.

Messrs. G. W. Allott and J. D. Young met the party at Penistone Station, and the motor coach run from the Station through charming country was much appreciated. On arrival at the Works parties were formed and expeditiously conducted through the various sections of the Works. Tea was served in the Newton Hall, and afterwards interesting films, describing the various activities of the Company to-day and at its inception, were shown.

The PRESIDENT (Mr. J. Albinson) paid tribute to the assistance which had been rendered by the Company to the Gas Industry over a lengthy period. It was nothing short of a romance to learn how, from the smallest beginnings, the Company had kept abreast of technical development and continued to add to its activities. Mr. T. CALDWELL then proposed a vote of thanks to the Directors for arranging the visit, and Mr. H. H. THOMAS seconded. Acknowledging the vote, Mr. W. T. KITCHING, General Manager of the Ironworks, stated that it was a great pleasure to have to welcome the members to their Works.



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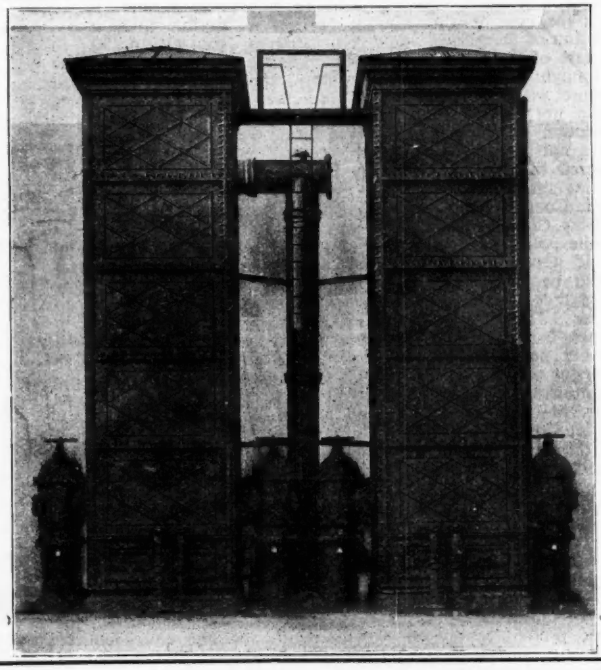

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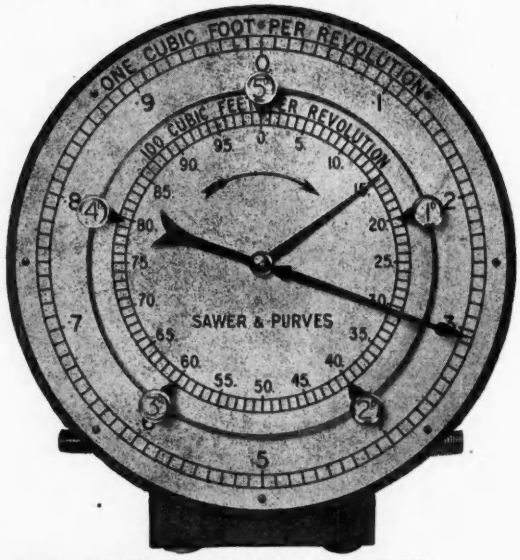

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Markets and Manufactures

Current Sales of Gas Products

The London Market

July 18.

To-day's values of Tar Products are as follows:

Pitch, nominal at about 33s. per ton f.o.b.
Creosote, 4¾d. to 5d.
Refined tar, 3¾d.
Pure toluole, 2s. 1d. to 2s. 2d.
Pure benzole, about 1s. 9d.
95/160 solvent naphtha, 1s. 7d.
90/160 pyridine, about 10s.

All per gallon naked at makers' works.

The Provinces

July 18.

Crude Gas-Works Tar, 15s. 3d. to 20s. 3d.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 31s. 6d. to 32s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. 6d. to 32s. 6d.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7½d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 3d. to 1s. 3½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¾d. to 4⅝d.; low gravity, 4¼d. to 4⅜d. Carbolic acid, 60's, 1s. 9d. to 2s. Naphthalene, £13 10s. to £16. Salts, 80s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsalable. Heavy oil†: Unfiltered heavy tar oil, min gr. 1080, 4¾d. to 4⅞d.; filtered heavy tar oil, min gr. 1080, 5¼d. to 5¾d.; heavy tar oil, gr. less than 1080, 4¼d. to 4¾d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

† Our attention has been called to the fact that more than one type of Heavy Tar Oil is sold to-day, and various types are used for varying purposes and command different prices. In future, therefore, three separate quotations will be given, viz.:

Unfiltered heavy tar oil, minimum gravity 1,080.
Filtered heavy tar oil, minimum gravity 1,080.
Heavy tar oil, gravity less than 1,080.

Scotland

GLASGOW, *July* 16.

The approaching holidays are having their effect on the market and business is almost at a standstill.

Crude gas-works tar.—Actual value is about 37s. to 38s. per ton *ex* works in bulk.

Pitch.—There is no real enquiry for this product and prices are unaltered at about 25s. per ton f.o.b. for export and 23s. per ton *ex* works in bulk for home trade.

Refined tar.—The road season continues to look after home deliveries and price is 3¾d. to 4d. per gallon f.o.r. naked. There is little export business at the moment and price is 3d. to 3⅛d. per gallon in buyers' packages at makers' works.

Creosote oil.—Makers' prices are maintained as under, although buyers' ideas are slightly lower: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6¼d. to 6½d. per gallon; neutral oil, 5d. to 5¼d. per gallon; all *ex* works in bulk.

Cresylic acid.—Buyers are only purchasing from "hand to mouth" and very little new business is being arranged. Prices are as follows: Pale, 97/99%, 1s. 7½d. to 1s. 9½d. per gallon; dark, 97/99%, 1s. 6d. to 1s. 7½d. per gallon; and pale, 99/100%, 2s. to 2s. 3d. per gallon; all according to quality *ex* works in buyers' packages.

Crude naphtha is quiet at 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 4d. to 1s. 4½d. per gallon and 90/190 heavy naphtha is 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is valued at 1s. 4d. to 1s. 4½d. per gallon.

Pyridine.—90/160 grade is 10s. 6d. to 11s. per gallon and 90/140 grade is 11s. to 12s. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole..	0	9½	to	0	10	per gall. at works
Motor „ ..	1	3	„	1	3½	„ „ „
90% „ ..	1	4	„	1	4½	„ „ „
Pure ..	1	8	„	1	8½	„ „ „

Contracts Advertised To-Day

Coal.
Newton Abbot and District Gas and Coke Company. [p. 197.]
Wallasey Gas Department. [p. 197.]

Plant Dismantling and Repairs.
Southport Gas Department. [p. 197.]

Tar and Liquor Plant.
Oldham Gas Department. [p. 197.]

Trade Note

"Evertaut" Industrial Seating.

Where efficiency is measured by output every means of conserving effort and banishing fatigue is of necessity adopted, which accounts, we learn from the makers, Evertaut, Ltd., Walsall Road, Perry Barr, Birmingham, 22, for the increasing number of "Evertaut" chairs in prominent factories all over the country. The present series includes stools and chairs to suit every class of work and every style of worker. Fixed stools are made in a range to suit various statures; other types include revolving and adjustable stools and chairs with fixed, swivelling, and adjustable backrests. Pressed steel angle section framework, triangulated for maximum stress resistance, ensures long life. Again, just as the chairs with their correctly positioned backrests brace up the users to constant fitness, so the "Evertaut" patent locking box, by the turning of a single nut, maintains the chair taut.

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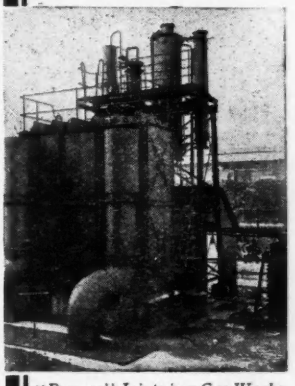
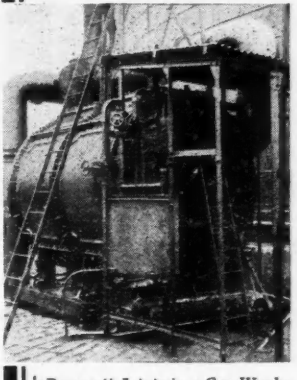


"Permac" Joints in a Gas Works.



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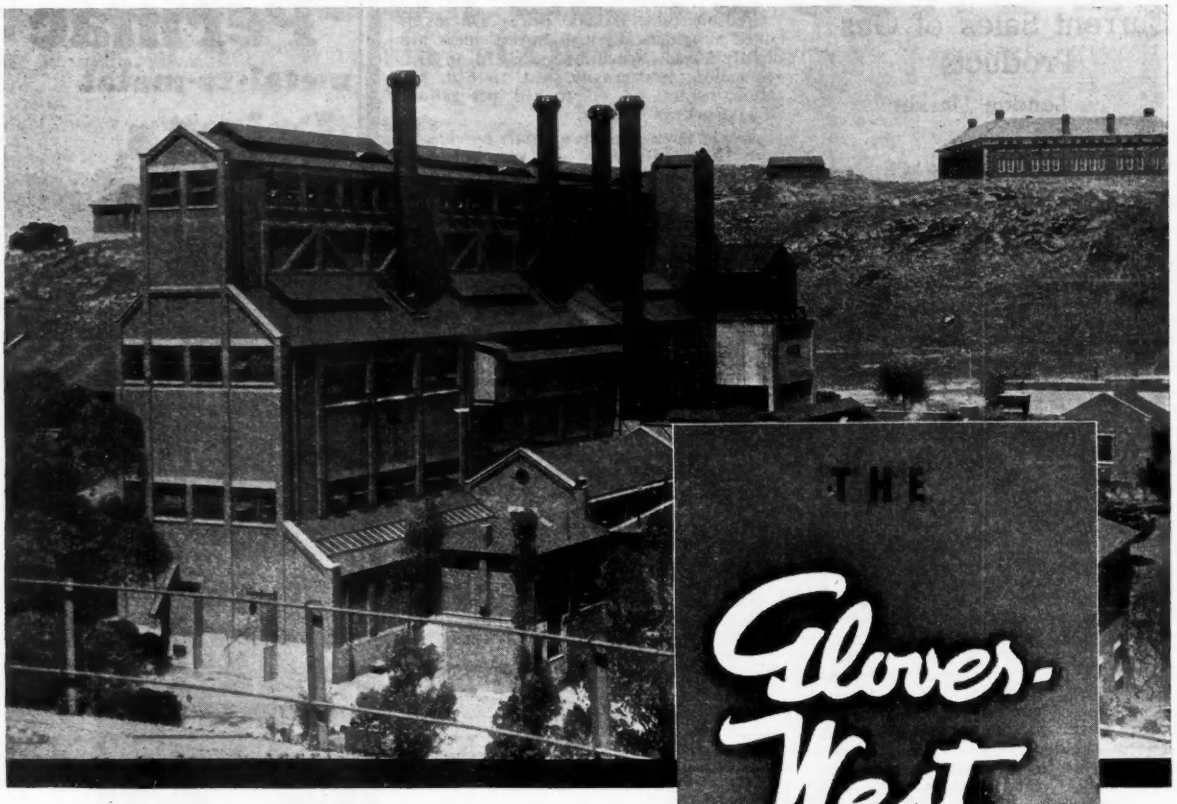

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GAS STOCKS AND SHARES

The fluctuations in Wall Street led to some uncertainty on the Stock Exchange last week and the Account closed under quiet conditions. Unfortunately the new Account is of three weeks' duration, including the Bank Holiday, and this fact did not improve the position. Gilt-edged stocks failed to come through unscathed and although a good demand set in at the close the final quotations were fractionally lower than a week ago. Some nervousness as to the pending dividend statements led to a preponderance of selling orders in the home rail market and prices again fell sharply. Industrials came under the cloud of Courtauld's interim dividend reduction from 3½ to 1½%, and most of the leading favourites were marked down. Rubber shares fluctuated in accordance with the price of the commodity, though some recovery was noticeable towards the end of the week. The only bright spots occurred in the mining and oil markets where a few specialities showed substantial improvement.

The Gas market was well supported at the opening last week, though the volume of business tailed off towards the close. Contrary, however, to the prevailing conditions in most sections, prices with one exception closed practically unchanged. In the Official List three fixed interest stocks hardened a point, but Imperial Continental, which had showed signs during the past fortnight of making a good recovery, dropped back 2 points to 125½. The only change in the Provinces was a rise of 2 points in Chester ordinary to 110½ on the Liverpool Exchange, while nominal quotations in the Supplementary List remained unaltered.

There is a fairly comprehensive list of ordinary stocks available at the time of writing, and for the adequate security offered under existing conditions the yields should prove attractive to the permanent investor. Most of the prices shown contain almost a full interim or half-year's dividend, and it will be noticed that several companies have an added security in that they supply water as well as gas. Among those offered are the following:

Amount Offered.	—	Price.	Last Dividend Paid.	Gross Yield.
£			%	£ s. d.
5,000	Associated Gas and Water £1 ..	20/6 free	5	4 17 6
1,000	Bombay	26/–	8	6 3 0
650	Bournemouth Gas & Water 7% Max.	162	7	4 6 6
860	Bristol	116	5	4 6 0
1,200	British	142	7½	5 5 6
800	Colombo Gas and Water	33/9	10	5 18 6
1,000	Commercial	85	5	5 17 6
120	Croydon Sliding Scale	142	7	4 18 7
1,000	Gas Consolidation "A"	20/–	5	5 0 0
1,300	" "B"	20/7½	6	5 16 0
5,000	Gas Light units	25/–	£5 12s.	4 9 8
400	Hampton Court	145	7¼	5 0 0
1,000	Imperial Continental	126	10	7 18 9
500	Newcastle units	23/6	5⅞	4 12 6
2,000	South Western Gas and Water £1 ..	18/–	5	5 11 1
2,000	Swansea	98	5	5 2 0
6,000	United Kingdom Gas £1	20/–	5	5 0 0
5,000	Wolverhampton*	141 free	7	4 19 3

* Full half-year's dividend payable February, 1939.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
1,767,439	Mar. 7	8	8	Alliance & Dublin Ord. ...	145—155	...
374,000	June 20	4	4	Do. 4 p.c. Deb. ...	93—108	...
734,733	May 9	5	5	Asscd. Gas & Water U'd'ts Ord.	17/6—19/6	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/–	...
444,389	,,	§–/4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/–	...
296,523	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	17/—19/–	...
500,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—99	...
558,890	Feb. 21	7	7	Barnet Ord. 7 p.c.	158—163	...
300,000	Apl. 4	1/4½	1/9	Bombay, Ltd.	24/6—26/6	...
179,915	Feb. 21	9½	9½	Bournemouth sliding scale ...	195—205	...
590,407	,,	7	7	Do. 7 p.c. max. ...	157—162	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	134—139	+1
50,000	June 20	3	3	Do. 3 p.c. Deb. ...	78—83	+1
262,025	,,	4	4	Do. 4 p.c. Deb. ...	97—102	...
335,000	,,	5	5	Do. 5 p.c. Deb. ...	115—120	...
357,900	Feb. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	145—150	...
649,955	,,	6½	6½	Do. 5 p.c. Con. ...	128—133	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	127—132	...
855,000	Mar. 7	7	8	British Ord.	138—143	...
100,000	June 3	7	7	Do. 7 p.c. Pref	140—145	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
450,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—99	...
100,000	22 May'33	6	4	Cape Town, Ltd.	1½—2½	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1½—3½	...
150,000	June 20	4½	4½	Do. 4½ p.c. Deb. ...	60—70	...
626,860	Feb. 7	6	6	Cardiff Con. Ord.	120—125	...
237,860	June 3	5	5	Do. 5 p.c. Red. Deb.	105—110	...
98,936	Mar. 21	2/–	2/–	Colombo Ord....	1½—1¾	...
24,510	,,	1/4½	1/4½	Do. 7 p.c. Pref.... ...	23/—25/–	...
739,453	Mar. 21	–/11·48	–/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref. ...	23/—25/–	...
1,775,005	Feb. 7	5	5	Commercial Ord.	81—86	...
140,000	—	—	—	Do. 4 p.c. Red. Pref.	99—102	...
620,000	June 3	3	3	Do. 3 p.c. Deb. ...	72—77	...
286,344	Feb. 7	5	5	Do. 5 p.c. Deb. ...	114—119	...
200,000	—	—	—	Do. 3½ p.c. Red. Deb.	99—102	...
807,560	Feb. 21	7	7	Croydon sliding scale ...	137—142	...
644,590	,,	5	5	Do. max. div. ...	107—112	...
620,385	June 20	5	5	Do. 5 p.c. Deb. ...	113—118	...
239,000	Feb. 7	5	5	East Hull Ord. 5 p.c.	96—101	...
185,355	Feb. 21	6	6	East Surrey Ord. 5 p.c. ...	118—123	...
176,211	June 3	5	5	Do. 5 p.c. Deb. ...	115—120	...
250,000	July 4	4	8	Gas Consolidation Ord. 'B' ...	20/—21/–*	...
250,000	May 9	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
19,223,324	Feb. 7	5⅔	5⅔	Gas Light & Coke Ord. ...	24/—25/–a	...
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	79—82	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref....	100—103	...
2,993,000	July 4	—	3½	Do. 3½ p.c. Red. Pref. ...	100—103*	...
8,602,497	May 23	3	3	Do. 3 p.c. Con. Deb....	81—84	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb....	111—114	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb....	109—112	...
700,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb....	97½—100½	...
270,466	Feb. 21	6	6	Harrogate New Cons. ...	118—123	...
157,500	Mar. 21	1/2½	1/–‡	Hong Kong and China Ord. ...	373,939	...
213,200	Feb. 7	6	6	Hornsey Con. 3½ p.c. ...	100—110	...
5,600,000	May 9	8	12	Imperial Continental Cap ...	123—128	−2
223,130	Jan. 17	3½	3½	Do. 3½ p.c. Red. Deb. ...	88—93	...
285,242	Feb. 21	8½	8½	Lea Bridge 5 p.c. Ord. ...	167—172	...
11,751	Feb. 21	8	10	Maidstone 5 p.c. Cap. ...	175—185	...
63,480	June 20	3	3	Do. 3 p.c. Deb.... ...	70—75	...
75,000	May 23	†10	†10	Malta & Mediterranean ...	137—142	...
				Metropolitan (of Melbourne)		...
392,000	Apl. 1	5½	5½	5½ p.c. Red. Deb.	99—102	...
231,977	Feb. 21	5	5	M.S. Utility 'C' Cons. ...	99—104	...

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
968,658	Feb. 21	4	4	M.S. Utility 4 p.c. Cons. Pref.	95—100	...
360,075	June 20	4	4	Do. 4 p.c. Deb. ...	95—100	...
148,955	,,	5	5	Do. 5 p.c. Deb. ...	113—118	...
675,000	May 9	†6	†6	Montevideo, Ltd.	72—77	...
250,000	Mar. 7	7½	7½	North Middlesex 6 p.c. Con.	145—150	...
396,160	Feb. 7	5	5	Northampton 5 p.c. max. ...	107—112	...
300,000	Apl. 25	†9	†7	Oriental, Ltd.	147—152	...
468,537	June 3	8	8	Plymouth & Stonehouse 5 p.c.	150—155	...
621,667	Feb. 7	8½	8½	Portsmouth & Gosport Cons. *	160—165	...
241,446	,,	5	5	Do. 5 p.c. max. ...	102—107	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
75,000	,,	—	4	Do. 4 p.c. Pref. ...	95—100	...
114,000	Feb. 7	5	5	Preston 5 p.c. Pref.	106—109	...
247,966	June 3	4	4	Primitiva 4 p.c. Cons. Deb. ...	98—103	...
625,959	Jan. 17	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
15,000	Mar. 21	6	6	San Paulo 6 p.c. Cum. Pref. ...	8½—9½	...
441,275	Apl. 25	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	21/—22/–	...
460,810	Mar. 21	–/10½	–/10½	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	...
133,201	Feb. 7	8½	5	Shrewsbury 5 p.c. Ord. ...	128—133	...
9,000	June 3	4	‡4	South African Ord.	4½—5½	...
1,371,752	Apl. 25	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	22/—24/–	...
871,636	Mar. 7	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pref.	20/6—22/6	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18/—20/–	...
450,000	Feb. 7	4	4	Do. 4 p.c. Deb.	100—103	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—98	...
6,709,895	Feb. 7	6	5	South Met. Ord.	106—109	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref. ...	130—135	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref. ...	97—100	...
1,895,445	June 20	3	3	Do. 3 p.c. Deb.	77½—80½	...
1,000,000	July 4	5	5	Do. 5 p.c. Red. Deb. ...	108—111*	...
600,000	,,	—	§31/–	Do. 3½ p.c. Red. Deb. ...	99—102*	...
1,543,795	Feb. 7	6	6	South Suburban Ord. 5 p.c. ...	118—123	...
512,825	,,	5	5	Do. 5 p.c. Pref.... ...	110—115	...
500,000	,,	4	4	Do. 4 p.c. Pref.... ...	95—100	...
250,000	,,	§18/9	3½	Do. 3½ p.c. Red. Pref. ...	98—101	...
888,587	June 3	5	5	Do. 5 p.c. Deb.... ...	115—120	...
250,000	,,	4	4	Do. 4 p.c. Deb.... ...	96—101	...
200,000	Mar. 1	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—99	...
427,859	Apl. 25	1/2½	9⅜	S. Western Gas & Water Ord.	16/6—18/6	...
160,523	,,	–/10½	–/10½	Do. 4½ p.c. Red. Cum. Pf.	19/—21/–	...
110,000	June 3	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
750,541	Feb. 7	5	5½	Southampton Ord. 5 p.c. ...	108—113	...
148,836	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
350,000	Feb. 7	5½	5½	Swansea 5½ p.c. Red. Pref. ...	108—113	...
94,000	June 3	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
1,076,490	Feb. 7	6½	6½	Tottenham and District Ord.	127—132	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref. ...	119—124	...
62,235	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
371,850	June 3	4	4	Do. 4 p.c. Deb. ...	96—101	+1
85,701	Apl. 25	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
888,629	Apl. 4	6	6	U. Kingdom Gas Cor. Ord. ...	18/6—20/6	...
937,743	May 9	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/6—21/6	...
500,000	,,	–/1·15	4	Do. 4 p.c. 1st Red. Cum. Pf.	19/—21/–	...
745,263	June 3	4½	4½	Do. 4½ p.c. 2nd Non-Cum.Pf.	16/—18/–	...
1,000,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...
373,939	Feb. 7	7	7	Uxbridge, &c., 5 p.c.	133—138	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Feb. 7	7	7	Wandsworth Consolidated ...	137—142	...
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	98—101	...
1,343,964	June 3	5	5	Do. 5 p.c. Deb. ...	115—120	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	97—102	...
558,342	Feb. 7	7	7	Watford and St. Albans Ord.	137—142	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	110—115	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref. ...	120—125	...
200,000	June 3	4	4	Do. 4 p.c. Red. Deb.	96—101	...
100,000	,,	3½	3½	Do. 3½ p.c. Red. Deb.	94—99	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations July 15.	Rise or Fall on Week.
202,152	Mar. 21	5	5	Ascot Ord.	103—108	...
128,182	Dec. 13	5	5	Do. 5 p.c. Pref.	108—113	...
31,035	Mar. 21	...	–/4⅛	Associated Utilities 4 p.c. Pref.	16/—18/–	...
100,000	Dec. 13	...	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Feb. 21	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	150—160	...
37,440	Feb. 7	10	10	Cam. Univ. & Town 10 p.c. max.	190—200	...
125,970	,,	7	7	Do. 7 p.c. max.	135—140	...
39,025	,,	5	5	Do. 5 p.c. max.	97—102	...
96,410	Feb. 7	4½	4½	Cardiff 4½ p.c. Pref.	95—100	...
150,000	Feb. 21	4	4	Croydon 4 p.c. Pref.	98—101	...
130,000	June 20	4	4	Do. 4 p.c. Deb.	97—102	...
65,000	Mar. 7	7½	8½	Eastbourne 'A' 5 p.c. ...	140—150	...
198,000	,,	6	7	Do. 'B' 3½ p.c.	115—125	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	June 20	5	5	Do. 5 p.c. Deb.	110—115	...
24,000	Feb. 21	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	3⅜—38	...
51,160	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...
152,600	Feb. 21	8	9	Guildford Cons.	167—172	...
54,055	,,	5	5	Do. 5 p.c. Pref.	108—113	...
68,250	June 20	5	5	Do. 5 p.c. Deb.	107—112	...
156,600	Feb. 21	7½	7½	Hampton Court Cons. ...	140—150	...
80,000	Feb. 21	4	4	Lea Bridge 4 p.c. Pref. ...	94—99	...
60,000	,,	6	6	Do. 6 p.c. Pref.	123—128	...
94,876	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
73,620	Mar. 7	8⅜	8⅜	Luton Cons. 'A'	160—165	...
107,960	Mar. 21	4	5⅛	Mid Kent Ord.	8⅜—9⅜	...
230,940	Feb. 7	10	10	Oxford & District Ord. ...	198—203	...
47,112	,,	5	5	Do. 5 p.c. Pref.	106—111	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113	...
126,193	May 9	7½	7½	Peterborough Ord.	135—145	...
64,990	Mar. 7	6½	7½	Redditch Ord....	120—130	...
166,850	Feb. 7	8	8	Romford Ord....	144—149	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—100	...
44,000	Mar. 21	5	5	Do. 5 p.c. Deb.	111—116	...
25,570	Feb. 7	5½	5½	Rugby 5½ p.c. Pref.	123—128	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	105—110	...
42,750	June 3	5½	5½	Do. 5½ p.c. Deb.	118—123	...
110,950	Feb. 21	8	8	Ryde Ord.	140—150	...
270,086	Mar. 21	7	7	Slough Ord.	128—133	...
21,000	June 20	5	5	Do. 5 p.c. Deb.	110—115	...
28,872	May 9	5½	5½	S. Midlard Gas Cpn. Ltd. Ord.	19/—21/–	...
28,866	Mar. 7	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...
137,730	Feb. 21	7	7	Southgate & Dist. 7 p.c. max.	140—145	...
62,500	,,	5	5	Do. 5 p.c. Pref.	110—115	...
117,228	Feb. 7	5	7	Swindon Cons.	104—109	...
60,425	June 3	5	5	Do. 5 p.c. Deb.	110—115	...
64,380	June 3	5	5	Torquay & Paignton 5 p.c. Pref.	107—112	...
130,000	Feb. 7	5	8	Wakefield Ord.	118—123	...
81,650	,,	5	5	Do. 5 p.c. max.	101—106	...
82,000	Feb. 21	6	6	Weymouth Ord.	105—110	...
98,384	Feb. 7	6	6	Wolverhampton 6 p.c. Pref.	118—123	...
160,000	June 20	5½	5½	Do. 5½ p.c.Rd.Db.	105—110	...
90,000	June 20	5	5	York 5 p.c. Red. Deb. ...	104—109	...
133,640	Feb. 21	6½	6½	Yorktown (Cam.) 5 p.c. Cons.	120—125	...
120,000	,,	5	5	Do. 5 p.c. Pref.	106—111	...
35,000	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
347,756	Feb. 7	5	6	Bath Cons.	120—122	...
1,667,250	Feb. 7	5	5	Bristol, 5 p.c. max.	113—115	...
120,420	June 3	4	4	Do. 1st 4 p.c. Deb. ...	101—103	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	101—103	...
328,790	,,	5	5	Do. 5 p.c. Deb.	119—122	...
274,000	Feb. 21	5	5	Newport (Mon). 5 p.c. max....	99—101	...
13,200	Mar. 21	7	8⅛	Pontyp'l Gas & W. 10 p.c. 'A'	13—14	...
13,600	,,	5	6	Do. 7 p.c. 'B'	12—12½	...
40,000	,,	5	6	Do. 7 p.c. 'C'	12—12½	...
140,778	Feb. 7	5	5	Weston-super-Mare Cons. ...	110—112	...
64,338	June 20	4	4	Do. 4 p.c. Deb.	93—95	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	151—154	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
157,150	Feb. 7	5	6½	Chester 5 p.c. Ord.	109—112	+2
92,500	June 20	4	4	Do. 4 p.c. Pref.	95—99	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101	...
2,167,410	Feb. 21	6	6	Liverpool 5 p.c. Ord.... ...	124⅜—125½	...
245,500	June 20	5	5	Do. 5 p.c. Red. Pref. ...	97—102	...
306,083	Jan. 17	4	4	Do. 4 p.c. Deb.... ...	100—102	...
106,280	Feb. 7	10	10	Preston 'A' 10 p.c.	202—212	...
188,219	,,	7	7	Do. 'B' 7 p.c.	144—154	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
122,577	Feb. 21	8	8	Blyth 5 p.c. Ord.	163½—164½	...
732,000	Feb. 21	5	5	Hartlepool G. & W. Cn. & New	110—112	...
2,061,315	Feb. 7	5	5⅛	Newcastle & Gateshead Con.	22/9—23/3a	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	99½—100½	...
776,706	June 20	3½	3½	Do. 3½ p.c. Deb. ...	88½—89½	...
277,285	May 9	5	5	Do. 5 p.c. Deb. '43 ...	104—106	...
332,351	Feb. 7	6	6	Sunderland 6 p.c. max. ...	137—139	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
542,270	Feb. 21	6	9	Derby Con.	135—140	...
55,000	June 3	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 20	5	5	Long Eaton 5 p.c. Pref. ...	10—12	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations July 15.	Rise or Fall on Week.
10,000	Feb. 21	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Feb. 21	6½	6½	Sheffield Cons.	140—143	...
95,000	July 4	4	4	Do. 4 p.c. Deb.	101—103	...

a The quotation is per £1 of Stock. *b* Actual. * Ex div.

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